

**CERTIFICATE OF "EXPRESS MAILING"**

"EXPRESS MAIL" Mailing Label Number: EL 753212709 US

Deposited: April 18, 2007

I hereby certify that this and the enclosed paper(s) and/or fee(s) is/are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated above and is addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450.

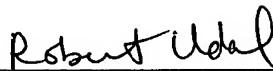
Patent Application No. : 10/551,663  
 Int. Appl. Filing Date : April 02, 2004  
 Inventor : Lewis Cheng et al  
 Title : ADAPTIVE ENGINE LOGIC USED IN TRAINING  
 ACADEMIC PROFICIENCY  
 Our Docket No. : 102907-438-NP  
 Int'l Appl. No. : PCT/US2004/10222  
 I. A. Filing Date : 04/02/2004  
 Priority Date : 04/02/2003

Submitted herewith are the following items for filing in the above-captioned application:

1. This Certificate of Express Mailing (No. EL 753212757 US) (2 page);
2. Supplemental Renewed Petition Under 37 CFR 1.47(a) (5 pages);
3. Exhibit A-1 (5 pages);
4. Exhibit A-2 (3 pages);
5. Exhibit B (20 pages);
6. Exhibit C (4 pages);
7. Exhibit C-1 (90 pages);
8. Exhibit C-2 (3 pages);
9. Exhibit C-3 (3 pages);
10. Exhibit C-4 (2 pages);

11. Exhibit C-5 (3 pages);
12. Exhibit D (6 pages);
13. Exhibit D-1 (2 pages);
14. Exhibit D-2 (2 pages);
15. Exhibit D-3 (3 pages);
16. Exhibit D-4 (3 pages);
17. Exhibit D-5 (5 pages);
18. Exhibit E ( 6 pages); and
19. Return Receipt Postcard.

TOTAL PAGES IN THIS SUBMISSION: 161 pages + postcard

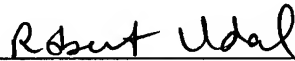
  
\_\_\_\_\_  
Robert P. Udal, Ph.D.

**CERTIFICATE OF "EXPRESS MAILING"**

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\_\_\_\_\_  
Robert P. Udal

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Application No. : 10/551,663  
Int. Appl. Filing Date : April 02, 2004  
Inventor : Lewis Cheng et al  
Title : ADAPTIVE ENGINE LOGIC USED IN TRAINING  
ACADEMIC PROFICIENCY  
Our Docket No. : 102907-438-NP  
Int'l Appl. No. : PCT/US2004/10222  
I. A. Filing Date : 04/02/2004  
Priority Date : 04/02/2003

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Mail Stop PCT  
Office of PCT Legal Administration  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**SUPPLEMENTAL RENEWED PETITION UNDER 37 CFR § 1.47(a) FOR FILING ON BEHALF OF NON-SIGNING INVENTOR(S)**

Applicant, Planetii, submit this Renewed Petition Under 37 CFR § 1.47(a) for Filing on Behalf of Non-Signing Inventor(s) in response to the Decision On "Petition Under 37 CFR § 1.47(a) for Filing on Behalf of Non-Signing Inventors" (hereinafter "Petition") mailed on 11 December

2006 from the U.S. Designated/Elected Office (DO/EO/US). See **Exhibit A-1** for a copy of the Decision (hereinafter “First Decision”).

### **BACKGROUND**

On 30 September 2005, Applicant, PLANETii Inc. (hereinafter “PLANETii”), doing business at 8/F, Enterprise Square 3, 39 Wang Chiu Road, Kowloon Bay, Hong Kong, filed with the United States Patent And Trademark Office (“USPTO”), *inter alia*, basic national fee and a Transmittal Letter to The United States Designated/Elected Office (DO/EO/US) concerning a Filing Under 35 USC 371, naming Lewis Cheng, Bella Kong, Jason Ng, Simon Lee and Joshua Levine as joint inventors. No an oath or declaration was filed.

On 26 May 2006, the U.S. Designated/Elected Office (DO/EO/US) mailed a Notification of Missing Requirements requesting the (1) oath or declaration and, (2) the surcharge set forth in 37 CFR 1.492(h) for small entity in compliance with 37 CFR 1.27. See **Exhibit A-2** for a copy of the Notification of Missing Requirements.

On 16 August 2006, Applicant filed a Petition Under 37 CFR 1.47(a) (hereinafter “Petition”) For Filing On Behalf of Non-Signing Joint Inventor Joshua Levine, in the above-captioned application, in response to the Notification of Missing Requirements from the U.S. Designated/Elected Office.

On 11 December 2006, the U.S. Designated/Elected Office issued a first Decision onf Petition, dismissing Applicant’s Petition for not satisfying the requirement for factual proof that supports Joshua Levine’s refusal to execute the application papers. The Decision stated that “[a] statement of first hand knowledge from Patrice King regarding the details of her attempts to contact Mr. Levine was not provided. No explanation as to the lack of first hand statement is given, other than Ms. King was formerly an attorney at the firm.”



On 09 February 2007, Applicant, PLANETii Inc., filed with the U.S. Designated/Elected Office a response to the Decision (**Exhibit A-1**), wherein Applicant renewed its petition to the Commissioner to accept the filing of the above-identified application by it, as the party to which the invention disclosed and claimed in this application rightfully belongs, and on behalf of and as agent for the non-signing inventor, Mr. Joshua Levine.

In response to the Decision (**Exhibit A-1**), Applicant hereby supplement the renewed petition filed on 09 February 2007 with the U.S. Designated/Elected Office (DO/EO/US). Applicant renews its petition to the Commissioner to accept the filing of the above-identified application by it, as the party to which the invention disclosed and claimed in this application rightfully belongs, and on behalf of and as agent for the non-signing inventor, Mr. Joshua Levine. In support of this Renewed Petition and attached hereto as **Exhibit B** are copies of a combined Declaration and Power of Attorney signed by Lewis Cheng, Bella Kong, Jason Ng and Simon Lee and an addendum executed by Lewis Cheng, Cofounder and Partner of the 37 CFR 1.47(a) Applicant, PLANETii Inc.

Also submitted in support of the this Renewed Petition and attached hereto as **Exhibit C** is a Declaration by Patrice A. King, the registered patent attorney that filed the above-captioned application when she was employed at Goodwin Procter LLP, to provide proof of the pertinent facts and to describe the efforts made to obtain Mr. Joshua Levine's signature.

Also submitted in support of the this Renewed Petition and attached hereto as **Exhibit D** is Robert P. Udal, a registered patent agent and an employee of Goodwin Procter LLP that is currently prosecuting the above-captioned application, to provide proof of the pertinent facts and to describe further efforts made to obtain Mr. Joshua Levine's signature.

Also submitted are Patent Assignment papers signed by Lewis Cheng, Bella Kong, Jason Ng, and Simon Lee, but not Joshua Levine, and a copy of employment agreement executed by Mr. Joshua Levine. The signed Patent Assignment papers and the executed employment agreement are hereto attached as **Exhibit E**. The signed Patent Assignment papers and the executed employment agreement support the statement that the 37 CFR 1.47(a) Applicant, PLANETii, is the owner of the invention disclosed in the above-noted application and therefore has sufficient proprietary interest in the application for patent.

Based on the aforementioned Declarations and documentary evidence inventor Joshua Levine, cannot be found or reached after diligent effort by the Applicant. As of the mailing date of this Petition neither the Applicant, PLANETii, nor the Applicant's legal representative, Goodwin Procter LLP, have been able to locate or reach Mr. Levine for his signatures for the application papers. It is unlikely that the Applicant will locate or reach Mr. Levine based solely on the information currently at hand. However, in the unlikely event that Mr. Joshua Levine is located or reached the application papers will be communicated to him and a request will be made for him to sign the application papers, and the signed application papers will be communicated to the U.S. Designated/Elected Office.

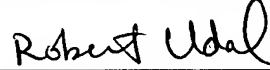
Therefore to preserve the rights of the parties and to prevent irreparable damage it is necessary for PLANETii to make application on behalf of and as agent for the non-signing inventor pursuant to 37 C.F.R. § 1.47(a).

Should the United States Designated/Elected Office (DO/EO/US) require or consider it advisable that further action by or a personal discussion with the Applicant might be helpful in advancing this case, the Office is invited to telephone the undersigned.

The Commissioner is authorized to charge all required fees, including the petition fee,

any additional fees, or credit any overpayment to Deposit Account 06-0923.

Respectfully submitted for Applicant,



---

Robert P. Udal (Reg. No. 56,608)  
Richard I. Samuel, Esq. (Reg. No. 24,435)  
GOODWIN PROCTER LLP  
599 Lexington Avenue  
New York, New York 10022  
212- 813-8840

## **Exhibit A-1**



11 DEC 2006

102907-438

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
www.uspto.gov

Patrice A King  
GOODWIN PROCTOR  
103 Eisenhower Parkway  
Roseland NJ 07068

In re Application of CHENG et al.

Application No.: 10/551,663

PCT No.: PCT/US04/10222

Int. Filing: 02 April 2004

Priority Date: 02 April 2003

Attorney Docket No.: 102907-438-NP

For: ADAPTIVE ENGINE LOGIC USED IN  
TRAINING ACADEMIC PROFICIENCY

: DECISION ON PETITION.

: UNDER 37 CFR 1.47(a)

This is a decision on applicant's petition under 37 CFR 1.47(a), filed in the United States Patent and Trademark Office (USPTO) on 16 August 2006, to accept the application without the signature of joint inventor, Joshua Levine.

### BACKGROUND

On 30 September 2005, applicant filed a transmittal letter (PTO-1390) requesting entry into the national stage in the United States of America under 35 U.S.C. § 371. Filed with the Transmittal Letter was, *inter alia*, the requisite basic national fee.

On 26 May 2006, a Notification of Missing Requirements (FORM PCT/DO/EO/905) was mailed to applicant indicating *inter alia*, that an oath or declaration in accordance with 37 CFR 1.497(a) and (b) and the surcharge for filing the oath or declaration after the thirty month period was required.

On 16 August 2006, applicant filed the instant petition along with a declaration, executed by the joint inventors on behalf of the nonsigning inventor. The petition under 37 CFR 1.47(a) in an attempt to satisfy the requirements of 35 U.S.C. 371(c)(4) requested the acceptance of the application without the signature of inventor, Joshua Levine alleging that Mr. Levine refuses to sign the application.

### DISCUSSION

A petition under 37 CFR §1.47(a) must be accompanied by (1) the fee under 37 CFR §1.17(h), (2) factual proof that the non-signing joint inventor(s) refuses to execute the application

or cannot be reached after diligent effort, (3) a statement of the last known address of the non-signing inventor(s), and (4) an oath or declaration by each available joint inventor on his or her own behalf and on behalf of the non-signing joint inventor(s).

The petition included the requisite petition fee, satisfying Item (1). Item (3) is satisfied because the last known address of non-signing inventor Joshua Levine was provided. With regard to item (4), the declaration executed by the available joint inventors on their behalf and on behalf of the non-signing inventor was submitted and satisfies the requirements of 37 CFR 1.47(a).

With respect to Item (2) above, Petitioner provided the declaration of Robert P. Udal in support of the petition under 37 CFR 1.47(a). According to Dr. Udal, a review of the law firm's application file reveals that Patrice King, a former Goodwin Procter attorney, sent a copy of the declaration of inventorship, patent assignment and PCT publication to Mr. Levine via email dated 13 April 2005 and via Federal Express. Further, Mr. Levine was instructed to return a copy of the executed documents to Goodwin Procter via email or facsimile and by mail. Reminder letters were sent on 18 May 2005 and 19 September 2005 via email to Mr. Levine. Similar reminder letters were sent via Federal Express. Mr. Levine did not respond to these communications. Dr. Udal concludes that Mr. Levine refuses to sign the declaration. Copies of the email correspondence accompanied the petition.

A statement of first hand knowledge from Patrice King regarding the details of her attempts to contact Mr. Levine was not provided. No explanation as to the lack of first hand statement is given, other than Ms. King was formerly an attorney at the firm. This raises the questions as to whether she is unavailable or unwilling to make such statement. Also it appears from the letters sent to Mr. Levine that a "Declaration of Inventorship" and a "Patent Assignment" were attached but no mention is made in the letter that a copy of the application papers (specification, claims and drawings) were presented. Thus, without the first hand statement of the person who prepared and sent the email/letter, it is not clear that a complete copy of the application papers, including *specification, claims and drawings* and declaration, were provided to Mr. Levine. What is required is that Mr. Levine be presented with a copy of all of the national stage application papers (oath and declaration, specification, including claims and drawings) for this application.

Furthermore, there is no evidence that the emails and letters were delivered to Mr. Levine. Petitioner has not produced a Federal Express delivery statement or an email delivery confirmation. Proof that a bona fide attempt was made to present a copy of the application papers to the nonsigning inventor for signature should be provided. The circumstances of the presentation of the application papers and the refusal must be specified in a statement of facts by the person who presented the inventor with the application papers and to whom the refusal was made.

Section 409.03(d) of the Manual of Patent Examining Procedure (MPEP), Proof of Unavailability or Refusal, states, in pertinent part:

*A refusal by an inventor to sign an oath or declaration when the inventor has not been presented with the application papers does not itself suggest that the inventor is refusing to join the application unless it is clear that the inventor understands exactly what he or she is being asked to sign and refuses to accept the application papers. A copy of the application papers should be sent to the last known address of the nonsigning inventor, or, if the nonsigning inventor is represented by counsel, to the address of the nonsigning inventor's attorney.... It is reasonable to require that the inventor be presented with the application papers before a petition under 37 CFR 1.47 is granted since such a procedure ensures that the inventor is apprised of the application to which the oath or declaration is directed. In re Gray, 115 USPQ 80 ( Comm'r Pat. 1956)*

Where a refusal of the inventor to sign the application papers is alleged, the circumstances of the presentation of the application papers and of the refusal must be specified in a statement of facts by the person who presented the inventor with the application papers and/or to whom the refusal was made. Statements by a party not present when an oral refusal is made will not be accepted.

Proof that a *bona fide* attempt was made to present a copy of the application papers (specification, including claims, drawings, and oath or declaration) to the nonsigning inventor for signature, but the inventor refused to accept delivery of the papers or expressly stated that the application papers should not be sent, may be sufficient. When there is an express oral refusal, that fact along with the time and place of the refusal must be stated in the statement of facts. When there is an express written refusal, a copy of the document evidencing that refusal must be made part of the statement of facts. The document may be redacted to remove material not related to the inventor's reasons for refusal.

When it is concluded by the 37 CFR 1.47 applicant that a nonsigning inventor's conduct constitutes a refusal, all facts upon which the conclusion is based should be stated in a statement of facts in support of the petition or directly in the petition. If there is documentary evidence to support facts alleged in the petition or any statement of facts, such evidence should be submitted. Whenever a nonsigning inventor gives a reason for refusing to sign the application oath or declaration, that reason should be stated in the petition.

(Emphasis added.)

In sum, Petitioner has satisfied Items (1), (3) and (4) above. However, Petitioner has not satisfied Item (2) by demonstrating: (1) a *bona fide* attempt was made to present a *copy of the application papers for U.S. application 10/551,663 (specification, including claims, drawings, and declaration)* to the nonsigning inventor for his signature and (2) Mr. Levine's refusal to sign,

either in writing or by telephone, these documents.


For the reasons set forth above, the evidence submitted does not support a finding that the nonsigning inventor refuses to sign the application at this time. Accordingly, it is inappropriate to accord the national stage application status under 37 CFR §1.47(a) at this time.

**CONCLUSION**

The petition under 37 CFR §1.47(a) is **DISMISSED WITHOUT PREJUDICE**.

Any reconsideration on the merits of the petition under 37 CFR §1.47(a) must be filed within TWO (2) MONTHS from the mail date of this decision. Any reconsideration request should include a cover letter entitled "Renewed Petition Under 37 CFR §1.47(a)." No petition fee is required. Any further extensions of time available may be obtained under 37 CFR 1.136(a).

Any further correspondence with respect to this matter should be addressed to the Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, Virginia 22313-1450, with the contents of the letter marked to the attention of the Office of PCT Legal Administration.

  
Cynthia M. Kratz  
Attorney Advisor  
PCT Legal Office  
Office of PCT Legal Administration

Telephone: (571) 272-3286  
Facsimile (571) 272-0459



## **Exhibit A-2**



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
10/551,663	Lewis Cheng	102907-438-NP

INTERNATIONAL APPLICATION NO.
-------------------------------

PCT/US04/10222

I.A. FILING DATE	PRIORITY DATE
04/02/2004	04/02/2003

Patrice A King  
 GOODWIN PROCTOR  
 103 Eisenhower Parkway  
 Roseland, NJ 07068

CONFIRMATION NO. 4591

371 FORMALITIES LETTER



\*OC000000018955906\*

Date Mailed: 05/26/2006

### NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated / Elected Office (37 CFR 1.495).

- Indication of Small Entity Status
- Copy of the International Application filed on 09/30/2005
- Copy of the International Search Report filed on 09/30/2005
- U.S. Basic National Fees filed on 09/30/2005
- Priority Documents filed on 09/30/2005

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

#### SUMMARY OF FEES DUE:

Total additional fees required for this application is \$65 for a Small Entity:

- \$65 Surcharge.

**ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION,**

**WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.**

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

SHAKEEL AHMED

Telephone: (703) 308-9140 EXT 208

**PART 1 - ATTORNEY/APPLICANT COPY**

U.S. APPLICATION NUMBER NO.	INTERNATIONAL APPLICATION NO.	ATTY. DOCKET NO.
10/551,663	PCT/US04/10222	102907-438-NP

## **Exhibit B**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No. : Not yet assigned  
First Named Inventor : Lewis Cheng et al.  
Attorney Docket No. : 102907-438NP  
Int'l Appl. No. : PCT/US2004/10222  
I.A. Filing Date : 04/02/2004  
Priority Date : 04/02/2003

**ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR  
SIGNATURE BY PERSON WITH SUFFICIENT PROPRIETARY INTEREST WHERE  
AN INVENTOR IS UNAVAILABLE TO SIGN AND ON BEHALF OF ALL THE  
INVENTORS WHO REFUSE TO SIGN OR CANNOT BE REACHED (37 CFR 1.47(B))**

I, Lewis Cheng, hereby declare as follows:

1. I am a citizen of Canada currently residing at #34B, 3 Seymour Road, Mid Levels,  
Hong Kong.

2. I am Cofounder and Partner of, and authorized by the following juristic entity with  
sufficient proprietary interest in the above-identified application:

Planetii USA, Inc.  
2311 City Place  
Edgewater, NJ 07020  
USA (hereinafter "Planetii")

3. By virtue of Planetii's proprietary interest, I sign this Declaration on behalf of, and as agent for the following non-signing inventor who either refuses to sign or cannot be found or located. The name and last known address of the non-signing inventor is:

Joshua Levine  
20 Dudley Street - #1  
Cambridge, MA 02140  
USA

4. Upon information and belief, I aver those facts that the inventor is required to state, 37 CFR 1.64(b).

5. To preserve the rights of the parties and to prevent irreparable damage, it is now necessary for Planetii to make application on behalf of and as agent for the above nonsigning inventor pursuant to 37 C.F.R. § 1.47(b) because the filing date of this application is required to make a claim of priority to International Application Number PCT/US04/10222, filed April 2, 2004, entitled "Adaptive Engine Logic Used in Training Academic Proficiency," which claims priority to U.S. Patent Application 60/459,773, filed April 2, 2003.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such false statements may jeopardize the validity of this document and application to which it relates.

Date: September 27, 2005

  
LEWIS CHENG

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In Re Application of:**

**First Named Inventor:** Lewis Cheng

**Examiner:**

**Serial No.:** 10/551,663

**Filed:** September 30, 2005

**Group Art Unit:**

**Title:** Adaptive Engine Logic Used in Training Academic Proficiency

**Docket No.:** 102907-438NP

**DECLARATION AND POWER OF ATTORNEY  
FOR UTILITY AND PLANT PATENT APPLICATION**

This Declaration is

☐ Submitted with Initial Filing.

☒ Submitted after Initial Filing (surcharge under 37 C.F.R. 1.16(e) required).

**As a below named inventor, I hereby declare that:**

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention as entitled above, the specification of which

☐ is attached hereto

☒ was filed on 09/30/2005 as United States Application No. 10/551,663 or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available



---

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
US 2004/010222	PCT	4/2/2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

Application Serial Number(s)	Filing Date
60/459,773	4/2/2003

---

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application

Application Serial Number(s)	Filing Date	Status (pending, patented, abandoned)

---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

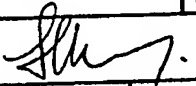
☒ Practitioners at Customer Number 24964 → [ Customer Number Bar Code Label]

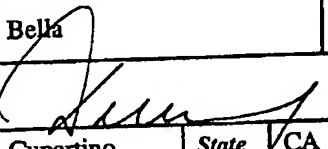
☐ Practitioner(s) named below:

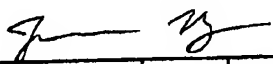
Name	Registration Number

☒ Please direct all future correspondence and telephone calls to:

<i>Attorney Name and Registration No.</i>	Richard I. Samuel, Esq. (Reg. No. 24,435)
<i>Firm Name</i>	Goodwin Procter LLP
<i>Address</i>	599 Lexington Ave
<i>City, State, Zip</i>	New York, NY 10022
<i>Telephone</i>	(212)-459-7021

Name of Inventor		[ ] A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Lewis	Family Name or Surname		Cheng			
Inventor's Signature				Date	04/28/05		
Residence: City	Mountain View	State	CA	Country	USA	Citizenship	Canada
Mailing Address	2400 W. El Camino Real, #715, Mountain View, CA 94040						
City	Mountain View	State	CA	ZIP	94040	Country	USA

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor			
<b>Given Name (first and middle)</b>	Bella	<b>Family Name or Surname</b>	Kong		
<b>Inventor's Signature</b>				<b>Date</b>	Apr 28, 2005
<b>Residence: City</b>	Cupertino	<b>State</b>	CA	<b>Country</b>	USA
<b>Mailing Address</b>	21732 Lindy Lane, Cupertino CA 95014, USA				
<b>City</b>	Cupertino	<b>State</b>	CA	<b>ZIP</b>	95014
		<b>Country</b>	USA		

Name of Inventor		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Jason			Family Name or Surname	Ng		
Inventor's Signature					Date	5/3/05	
Residence: City	New York	State	NY	Country	10013 USA	Citizenship	USA
Mailing Address	50 Bayard Street #7M, New York, NY 10013, USA						
City	New York	State	NY	ZIP	10013	Country	USA

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Simon			<b>Family Name or Surname</b>	Lee		
<b>Inventor's Signature</b>					<b>Date</b>		
<b>Residence: City</b>	Tsmi Sha Tsui	<b>State</b>		<b>Country</b>	Hong Kong	<b>Citizenship</b>	Canada
<b>Mailing Address</b>	Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong,						
<b>City</b>	Tsmi Sha Tsui	<b>State</b>		<b>ZIP</b>		<b>Country</b>	Hong Kong

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Joshua			<b>Family Name or Surname</b>	Levine		
<b>Inventor's Signature</b>					<b>Date</b>		
<b>Residence: City</b>	Cambridge	<b>State</b>	MA	<b>Country</b>	USA	<b>Citizenship</b>	USA
<b>Mailing Address</b>	20 Dudley St #1, Cambridge, MA 02140, USA						
<b>City</b>	Cambridge	<b>State</b>	MA	<b>ZIP</b>	02140	<b>Country</b>	USA

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In Re Application of:**

**First Named Inventor:** Lewis Cheng

**Serial No.:** 10/551,663

**Filed:** September 30, 2005

**Title:** Adaptive Engine Logic Used in Training Academic Proficiency

**Docket No.:** 102907-438NP

**Examiner:**

**Group Art Unit:**

**DECLARATION AND POWER OF ATTORNEY  
FOR UTILITY AND PLANT PATENT APPLICATION**

This Declaration is

☐ Submitted with Initial Filing.

☒ Submitted after Initial Filing (surcharge under 37 C.F.R. 1.16(e) required).

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention as entitled above, the specification of which

☐ is attached hereto

☒ was filed on 09/30/2005 as United States Application No. 10/551,663 or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available

---

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
US 2004/010222	PCT	4/2/2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

Application Serial Number(s)	Filing Date
60/459,773	4/2/2003

---

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application

Application Serial Number(s)	Filing Date	Status (pending, patented, abandoned)

---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

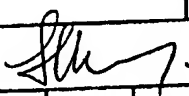
☒ Practitioners at Customer Number 24964 → [ Customer Number Bar Code Label]

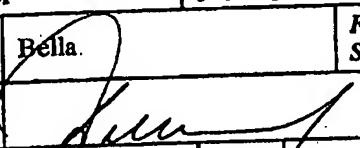
☐ Practitioner(s) named below:

Name	Registration Number

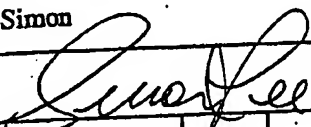
☒ Please direct all future correspondence and telephone calls to:

<i>Attorney Name and Registration No.</i>	Richard I. Samuel, Esq. (Reg. No. 24,435)
<i>Firm Name</i>	Goodwin Procter LLP
<i>Address</i>	599 Lexington Ave
<i>City, State, Zip</i>	New York, NY 10022
<i>Telephone</i>	(212)-459-7021

Name of Inventor		[ ] A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Lewis	Family Name or Surname		Cheng			
Inventor's Signature				Date	04/28/05		
Residence: City	Mountain View	State	CA	Country	USA	Citizenship	Canada
Mailing Address	2400 W. El Camino Real, #715, Mountain View, CA 94040						
City	Mountain View	State	CA	ZIP	94040	Country	USA

Name of Inventor		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Bella			Family Name or Surname	Kong		
Inventor's Signature					Date	Apr 28, 2005	
Residence: City	Cupertino	State	CA	Country	USA	Citizenship	Canada
Mailing Address	21732 Lindy Lane, Cupertino CA 95014, USA						
City	Cupertino	State	CA	ZIP	95014	Country	USA

Name of Inventor		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Jason			Family Name or Surname	Ng		
Inventor's Signature					Date		
Residence: City	New York	State	NY	Country	10013	Citizenship	USA
Mailing Address	50 Bayard Street #7M, New York, NY 10013, USA						
City	New York	State	NY	ZIP	10013	Country	USA

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Simon			<b>Family Name or Surname</b>	Lee		
<b>Inventor's Signature</b>					<b>Date</b>	05/12/05	
<b>Residence: City</b>	Tsim Sha Tsui	<b>State</b>		<b>Country</b>	Hong Kong	<b>Citizenship</b>	Canada
<b>Mailing Address</b>	Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong,						
<b>City</b>	Tsim Sha Tsui	<b>State</b>		<b>ZIP</b>		<b>Country</b>	Hong Kong

Name of Inventor		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Joshua			Family Name or Surname	Levine		
Inventor's Signature					Date		
Residence: City	Cambridge	State	MA	Country	USA	Citizenship	USA
Mailing Address	20 Dudley St #1, Cambridge, MA 02140, USA						
City	Cambridge	State	MA	ZIP	02140	Country	USA

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, Bella Kong, and Simon Lee, each citizens of Canada, and Jason Ng and Joshua Levine, each citizens of the United States, as ASSIGNORS, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040, USA; 21732 Lindy Lane, Cupertino CA 95014, USA; Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong; 50 Bayard Street #7M, New York, NY 10013, USA; and 20 Dudley St #1, Cambridge, MA 02140, USA; are the inventors of the invention entitled, Adaptive Engine Logic Used in Training Academic Proficiency, for which an application for a United States Patent was filed on April 2, 2003, Serial no. 60/459,773, and for which a PCT application was filed on April 2, 2004, Serial no. PCT/US04/10222 and,

WHEREAS, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: 4/28/05

[Signature]  
Lewis Cheng

Date: 04/28/05

[Signature]  
Bella Kong

Date: 5/3/05

[Signature]  
Jason Ng

Date: \_\_\_\_\_

\_\_\_\_\_  
Simon Lee

Date: \_\_\_\_\_

\_\_\_\_\_  
Joshua Levine

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, Bella Kong, and Simon Lee, each citizens of Canada, and Jason Ng and Joshua Levine, each citizens of the United States, as ASSIGNORS, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040, USA; 21732 Lindy Lane, Cupertino CA 95014, USA; Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong; 50 Bayard Street #7M, New York, NY 10013, USA; and 20 Dudley St #1, Cambridge, MA 02140, USA; are the inventors of the invention entitled, Adaptive Engine Logic Used in Training Academic Proficiency, for which an application for a United States Patent was filed on April 2, 2003, Serial no. 60/459,773, and for which a PCT application was filed on April 2, 2004, Serial no. PCT/US04/10222 and,

WHEREAS, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: 04/28/05

[Signature]  
Lewis Cheng

Date: 04/28/05

[Signature]  
Bella Kong

Date: \_\_\_\_\_

[Signature]  
Jason Ng

Date: 05/12/05

[Signature]  
Simon Lee

Date: \_\_\_\_\_

\_\_\_\_\_  
Joshua Levine

## **Exhibit C**



**Certificate of Express Mail**

I hereby certify that this and the enclosed paper(s) and/or fee(s) is/are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450.

Robert P. Udall      EL 753212709 US      4/18/2007  
Robert P. Udall      "EXPRESS MAIL" Label No.      Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Application No. : 10/551,663  
Int. Appl. Filing Date : April 02, 2004  
Inventor : Lewis Cheng et al  
Title : ADAPTIVE ENGINE LOGIC USED IN TRAINING  
ACADEMIC PROFICIENCY  
Our Docket No. : 102907-438-NP  
Int'l Appl. No. : PCT/US2004/10222  
Int'l Appl. Filing Date : 04/02/2004  
Priority Date : 04/02/2003

Mail Stop PCT  
Commissioner for Patents  
Office of PCT Legal Administration  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION OF PATRICE A. KING IN SUPPORT OF RENEWED PETITION  
FOR FILING ON BEHALF OF NON-SIGNING INVENTOR(S)**

I, Patrice A. King, declare as follows:

1. I am the registered patent attorney that filed the above-referenced patent application when I was an employee of Goodwin Procter LLP, attorneys of which are the Applicant's legal representative of record in this case.

2. This declaration details factual accounts of my efforts to reach and deliver application papers to the Non-signing Joint Inventor, Mr. Joshua Levine.

3. On 13 April 2005 I sent electronic copies of Declaration of Inventorship, Patent Assignment and PCT Publication No. WO 2004090834, a published copy of the above-referenced international application No. PCT/US2004/010222, via e-mail to Mr. Joshua Levine at his e-mail address: [josh@hookerstreetband.com](mailto:josh@hookerstreetband.com). Copies of the printout of the sent e-mail and application papers are hereto attached as **Exhibit C-1**.

4. In the e-mail I instructed Mr. Levine to review the published application. Declaration of Inventorship and the Patent Assignment and to execute the Declaration of Inventorship and the Patent Assignment, and to return a copy of the executed documents to our offices by e-mail, facsimile and/or mail.

5. On 13 April 2005 I also sent, via Federal Express, to Mr. Levine at his home address, 20 Dudley St. # 1, Cambridge, MA 02140, a FedEx Package containing hard copies of the Declaration of Inventorship, Patent Assignment and PCT Publication No. WO 2004090834, a published copy of the above-referenced international application No. PCT/US2004/010222, along with a letter from me to Mr. Levine instructing him to review the documents and to execute the Declaration of Inventorship and the Patent Assignment and to return the executed documents to our offices by e-mail, facsimile and/or mail. Copies of the FedEx Label I created for the Federal Express Package and the instruction letter I wrote for Mr. Levine are attached hereto as **Exhibit C-2**.

6. On 17 May 2005 I again e-mailed a second electronic copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090834, a published copy of the above-referenced international application No. PCT/US2004/010222, to Mr. Joshua Levine at his e-mail address: [josh@hookerstreetband.com](mailto:josh@hookerstreetband.com). A copy of the printout of the sent e-mail is attached hereto as **Exhibit C-3**.

7. For a second time, on 15 September 2005 I again sent a FedEx Package containing hard copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090834, a published copy of the above-referenced international application No. PCT/US2004/10222, and an instruction letter from me to Mr. Joshua Levine at his home address: 20 Dudley St. # 1, Cambridge, MA 02140. A copy of the FedEx Label that I created for the FedEx Package is attached hereto as **Exhibit C-4**.

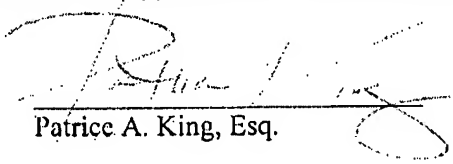
8. For a third time, on 19 September 2005 I sent to Mr. Joshua Levine a third set of electronic copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090834, along with instructions for him to review the application papers and to execute the Declaration of Inventorship and the Patent Assignment and to return the executed documents to our offices by e-mail, facsimile and/or mail. Attached hereto as **Exhibit C-5** is a copy of the printout of the e-mail that I sent.

9. In each of the five instances I enumerated above I never received executed application papers from Mr. Levine.


I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such false statements may jeopardize the validity of this document and application to which it relates.

Date:

1.17.07

  
Patrice A. King, Esq.

## **Exhibit C-1**

From: "King, Patrice A" <PKing@goodwinprocter.com>  
Subject: Planetii - US Patent Application  
Date: April 13, 2005 6:14:59 AM CST  
To: <josh@hookerstreetband.com>  
Cc: "Lewis Cheng" <lewis.cheng@planetii.com>  
3 Attachments, 2.3 MB 

<<WO2004090834A2.pdf>> <<4405035\_1.doc>> <<Pii Assignment Rights-1.doc>>  
RETURN RECEIPT REQUESTED

*Via E-Mail and Federal Express*

US Patent Application for ADAPTIVE ENGINE LOGIC USED IN TRAINING ACADEMIC PROFICIENCY  
Appl. No.: US04/10222

Dear Joshua:

Attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney  
Goodwin Procter LLP  
103 Eisenhower Parkway  
Roseland, New Jersey 07068  
Direct Dial: 973.994.7896  
General: 973.992.1990  
Fax: 973.992.4643  
E-mail: [pkling@goodwinprocter.com](mailto:pkling@goodwinprocter.com)  
URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)

\*\*\*\*\*  
This message is intended only for the designated recipient(s). It may contain confidential or proprietary information and may be subject to the attorney-client privilege or other confidentiality protections. If you are not a designated recipient, you may not review, copy or distribute this message. If you receive this in error, please notify the sender by reply e-mail and delete this message. Thank you.  
\*\*\*\*\*



WO2004090834A2.pdf (2.1 MB) 4405035\_1.doc (92.0 KB) Pii Assignment Rights-1.doc (21.5 KB)

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

**WHEREAS**, WE, Lewis Cheng, Bella Kong, and Simon Lee, each citizens of Canada, and Jason Ng and Joshua Levine, each citizens of the United States, as **ASSIGNORS**, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040, USA; 21732 Lindy Lane, Cupertino CA 95014, USA; Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong; 50 Bayard Street #7M, New York, NY 10013, USA; and 20 Dudley St #1, Cambridge, MA 02140, USA; are the inventors of the invention entitled, **Adaptive Engine Logic Used in Training Academic Proficiency**, for which an application for a United States Patent was filed on April 2, 2003, Serial no. 60/459,773, and for which a PCT application was filed on April 2, 2004, Serial no. PCT/US04/10222 and,

**WHEREAS**, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, **ASSIGNEE** is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

**NOW, THEREFORE**, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said **ASSIGNORS**, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said **ASSIGNEE**, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

**AND WE HEREBY** authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said **ASSIGNEE**, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

**AND WE HEREBY** covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

**AND WE HEREBY** further covenant and agree that we will communicate to the said **ASSIGNEE**, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said **ASSIGNEE**, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

**IN TESTIMONY WHEREOF**, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: \_\_\_\_\_

\_\_\_\_\_  
Lewis Cheng

Date: \_\_\_\_\_

\_\_\_\_\_  
Bella Kong

Date: \_\_\_\_\_

\_\_\_\_\_  
Jason Ng

Date: \_\_\_\_\_

\_\_\_\_\_  
Simon Lee

Date: \_\_\_\_\_

\_\_\_\_\_  
Joshua Levine

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In Re Application of:**

**First Named Inventor:** Lewis Cheng

**Serial No.:**

**Filed:**

**Title:** Adaptive Engine Logic Used in Training Academic Proficiency

**Docket No.:** 102907-438NP

**Examiner:**

**Group Art Unit:**

**DECLARATION AND POWER OF ATTORNEY  
FOR UTILITY AND PLANT PATENT APPLICATION**

This Declaration is

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**As a below named inventor, I hereby declare that:**

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention as entitled above, the specification of which

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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.



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I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
US 2004/010222	PCT	4/2/2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

Application Serial Number(s)	Filing Date
60/459,773	4/2/2003

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I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application

Application Serial Number(s)	Filing Date	Status (pending, patented, abandoned)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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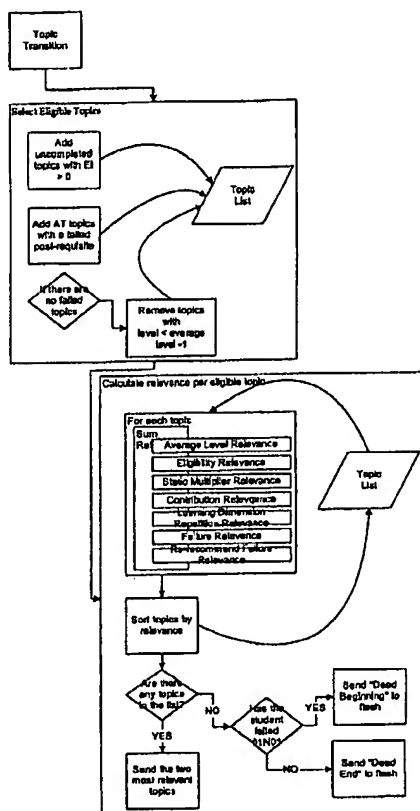
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[Continued on next page]

(54) Title: **ADAPTIVE ENGINE LOGIC USED IN TRAINING ACADEMIC PROFICIENCY**

(57) Abstract: The present invention is an intelligent, adaptive system that takes in information and reacts to the specific information given to it, using a set of predefined heuristics. Therefore, each individual's information (which can and is unique) will feed the engine, and then provide a unique experience to that individual. One embodiment of the present invention discussed herein focuses on Mathematics however the invention is not limited thereby as the same logic can be applied to other academic subjects.



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## 1 TITLE

2 Adaptive Engine Logic Used in Training Academic Proficiency

3

## 4 CLAIM OF PRIORITY/CROSS REFERENCE OF RELATED

## 5 APPLICATION(S)

6 This application claims the benefit of priority of United States Provisional  
7 Application Number 60/459,773, filed April 2, 2003, entitled "Adaptive Engine  
8 Logic Used in Training Academic Proficiency," hereby incorporated in its  
9 entirety herein.

10

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## 18 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR

## 19 DEVELOPMENT

20 Not applicable.

21

1

## 2 BACKGROUND

## 3 1. Field of the Invention

4 The present invention relates generally to computerized learning and more  
5 particularly to an adaptive learning system and method that utilizes a set of  
6 heuristics to provide a learning environment unique to an individual.

7

## 8 2. Description of Related Art

9

10 The Problem

11 A child's learning pace varies from child to child. Schools often provide  
12 education that is tailored to a general standard, to the "normal" child. Teachers  
13 and facilitators often gear materials, e.g. static curriculum, and pedagogical  
14 direction toward the majority of the classroom – the so-called normal child – and  
15 therefore neglect children with different needs on either end of the spectrum.

16

17 Because the collection of concepts mastered by different students varies, without  
18 a personalized curriculum tailored for the student, it is oftentimes difficult to help  
19 different students with different abilities to develop a solid foundation in a  
20 particular subject.

21

1    Prior Art Solutions to the Problem

2    There are a number of education-based, and more specifically math-based,  
3    Internet web sites available today. Also, there are many offline products, such as  
4    workbooks, CD-ROMs, and games that also address this issue. In addition there is  
5    also traditional human help, such as a teacher and/or tutor.

6

7    Commercial examples in the math arena:

8

9    www.aleks.com - A fully automated online math tutor for K-12 and Higher  
10    Education students. Below is an excerpt from their corporate website.

11

12    ALEKS is a revolutionary Internet technology, developed at the University of  
13    California by a team of gifted software engineers and cognitive scientists, with the  
14    support of a multi-million dollar grant from the National Science Foundation.

15    ALEKS is fundamentally different from previous educational software. At the  
16    heart of ALEKS is an artificial intelligence engine -- an adaptive form of  
17    computerized intelligence -- which contains a detailed structural model of the  
18    multiplicity of the feasible knowledge states in a particular subject. Taking  
19    advantage of state of the art software technology, ALEKS is capable of searching  
20    an enormous knowledge structure efficiently, and ascertaining the exact  
21    knowledge state of the individual student. Like "Deep Blue," the IBM computer

1 system that defeated international Chess Grand master Garry Kasparov, ALEKS  
2 interacts with its environment and adapts its output to complex and changing  
3 circumstances. ALEKS is based upon path breaking theoretical work in Cognitive  
4 Psychology and Applied Mathematics in a field of study called "Knowledge  
5 Space Theory." Work in Knowledge Space Theory was begun in the early 1980's  
6 by an internationally renowned Professor of Cognitive Sciences who is the  
7 Chairman and founder of ALEKS Corporation.

8 • Using state-of-the-art computerized intelligence and Web-based  
9 programming, ALEKS interacts with each individual student, and functions as  
10 an experienced one-on-one tutor.

11 • Continuously adapting to the student, ALEKS develops and maintains a  
12 precise and comprehensive assessment of your knowledge state.

13 • ALEKS always teaches what the individual is most ready to learn.

14 • For a small fraction of the cost of a human tutor, ALEKS can be used at any  
15 time: 24 hours per day; 7 days per week, for an unlimited number of hours.

16

17 Kumon Math Program- a linear and offline paper-based math program that helps  
18 children develop mechanical math skills. 2.5 million students or more worldwide.

19

20 Math Blasters- A CD-ROM that provides some math training through fun games.

21

1 Ms. Lindquist: The Tutor – a web-based math tutor specialized in helping  
2 children solving algebraic problems using a set of artificial intelligence  
3 algorithms. It was developed by a researcher at Carnegie Mellon University

4

5 Cognitive Tutor – Developed by another researcher at Carnegie Mellon  
6 University. It helps students solve various word-based algebraic and geometric  
7 problems with real-time feedback as students perform their tasks. The software  
8 predicts human behavior, makes recommendations, and tracks student-user  
9 performance in real time. The software is sold by Carnegie Learning.

10

11 Limitations of the Prior Art

12 Many internet/web sites do not offer a truly personalized experience. In their  
13 systems, each student-user answers the same 10 questions (for example),  
14 regardless of whether they answer the first questions correctly or incorrectly.  
15 These are examples of non-intelligence, or limited intelligence, backed by a  
16 linear, not relational, curriculum.

17

18 Other offline products (like CD-ROMs) have the ability to provide a somewhat  
19 personalized path, depending on questions answered correctly or incorrectly, but  
20 their number of questions is limited to the storage capacity of the CD-ROM. CD-  
21 ROMs and off-line products are also not flexible to real-time changes to content.

1

2 CD-ROMs also must be installed on a computer. Some may only work with  
3 certain computer types (e.g., Mac or PC), and if the computer breaks, one must re-  
4 install it on another machine, and start all over with the product.

5

6 The Present Solution to the Problem

7 The present invention solves the aforementioned limitations of the prior art. The  
8 present invention is intended to fill in the gaps of what schools cannot provide—  
9 an individualized curriculum that is driven by the child's own learning pace and  
10 standards. The major goal is to use the invention to help each child build a solid  
11 foundation in the subject as early as possible, and then move on to more difficult  
12 material. The present invention is an intelligent, adaptive system that takes in  
13 information and reacts to the specific information given to it, using a set of  
14 predefined heuristics. Therefore, each individual's information (which can and is  
15 unique) will feed the engine, and then provide a unique experience to that  
16 individual. One embodiment of the present invention discussed herein focuses on  
17 Mathematics however the invention is not limited thereby as the same logic can  
18 be applied to other academic subjects.

19

20 In accordance with one aspect of the present invention, there is provided, based  
21 on a curriculum chart with correlation coefficients and prerequisite information,

1 unlimited curriculum paths that respond to students' different learning patterns  
2 and pace. Topics are connected with each other based on pre-requisite/post-  
3 requisite relationship thus creating a complex 3-D curriculum web. Each  
4 relationship is also quantified by a correlation coefficient. Each topic contains a  
5 carefully designed set of questions in increasing difficulty levels (e.g., 1-100).  
6 Thus, without acquiring a certain percentage of pre-requisites, a student-user will  
7 be deemed not ready to go into a specific topic.

8  
9 In a second aspect of the present invention, all of the programming for the  
10 heuristics and the logic is done in the Java programming language. In addition,  
11 the present invention has been adapted to accept information, via the Internet,  
12 using a browser as a client. Furthermore, information is stored in a database, to  
13 help optimize the processing of the information.

14  
15 Certain features and advantages of the present invention include: a high level of  
16 personalization, continuous programs accessible anytime and anywhere, real-time  
17 performance tracking systems that allow users, e.g., parents to track progress  
18 information online, a relational curriculum, enabling individualized paths from  
19 question to question and from topic to topic, worldwide comparison mechanisms  
20 that allow parents to compare child performance against peers in other locations.

21

1 The above aspects, features and advantages of the present invention will become  
2 better understood with regard to the following description.

3

4

#### 5 BRIEF DESCRIPTION OF THE DRAWING(S)

6 Referring briefly to the drawings, embodiments of the present invention will be  
7 described with reference to the accompanying drawings in which:

8

9 Figures 1 – 15 depict various aspects and features of the present invention in  
10 accordance with the teachings expressed herein.

11

#### 12 DETAILED DESCRIPTION OF THE PRESENT INVENTION

13 Although what follows is a description of a preferred embodiment of the  
14 invention, it should be apparent to those skilled in the art that the following is  
15 illustrative only and not limiting, having been presented by way of example only.

16 All the features disclosed herein may be replaced by alternative features serving  
17 the same purpose, and equivalents of similar purpose, unless expressly stated  
18 otherwise. Therefore, numerous other embodiments of the modifications thereof  
19 are contemplated as falling within the scope of the present invention. However,  
20 all specific details may be replaced with generic ones. Furthermore, well-known



1 features have not been described in detail so as not to obfuscate the principles  
2 expressed herein.

3

4 Moreover, the techniques may be implemented in hardware or software, or a  
5 combination of the two. In one embodiment, the techniques are implemented in  
6 computer programs executing on programmable computers that each include a  
7 processor, a storage medium readable by the processor (including volatile and  
8 non-volatile memory and/or storage elements), at least one input device and one  
9 or more output devices. Program code is applied to data entered using the input  
10 device to perform the functions described and to generate output information.  
11 The output information is applied to one or more output devices.

12

13 Each program is preferably implemented in a high level procedural or object  
14 oriented programming language to communicate with a computer system,  
15 however, the programs can be implemented in assembly or machine language, if  
16 desired. In any case, the language may be a compiled or interpreted language.

17

18 Each such computer program is preferably stored on a storage medium or device  
19 (e.g., CD-ROM, NVRAM, ROM, hard disk, magnetic diskette or carrier wave)  
20 that is readable by a general or special purpose programmable computer for  
21 configuring and operating the computer when the storage medium or device is

1 read by the computer to perform the procedures described in this document. The  
2 system may also be considered to be implemented as a computer-readable storage  
3 medium, configured with a computer program, where the storage medium so  
4 configured causes a computer to operate in a specific and predefined manner.

5

6 The engine and the algorithms and methodology that it was developed for, is  
7 currently specific for Mathematics at this time. But, using the same structure, it  
8 can be broadened and used in any numbers of scenarios. The function of the  
9 engine is primarily to react on information, or data, given to it. Then, based on a  
10 set of rules or governing heuristics, it will react to the data, and provide  
11 meaningful output. This ideology can be used in a number of different  
12 applications.

13

14 Figures 1 and 2 illustrate exemplary hardware configurations of a processor-  
15 controlled system on which the present invention is implemented. One skilled in  
16 the art will appreciate that the present invention is not limited by the depicted  
17 configuration as the present invention may be implemented on any past, present  
18 and future configuration, including for example,  
19 workstation/desktop/laptop/handheld configurations, client-server configurations,  
20 n-tier configurations, distributed configurations, networked configurations, etc.,  
21 having the necessary components for carrying out the principles expressed herein.

1

2 In its most basic embodiment however, Figure 1 depicts a system 700 comprising,  
3 but not limited to, a bus 705 that allows for communication among at least one  
4 processor 710, at least one memory 715 and at least one storage device 720. The  
5 bus 705 is also coupled to receive inputs from at least one input device 725 and  
6 provide outputs to at least one output device 730. The at least one processor 710 is  
7 configured to perform the techniques provided herein, and more particularly, to  
8 execute the following exemplary computer program product embodiment of the  
9 present invention. Alternatively, the logical functions of the computer program  
10 product embodiment may be distributed among processors connected through  
11 networks or other communication means used to couple processors. The  
12 computer program product also executes under various operating systems, such as  
13 versions of Microsoft Windowsä, Apple Macintoshä, UNIX, etc. Additionally, in  
14 a preferred embodiment, the present invention makes use of conventional  
15 database technology 740 such as that found in the commercial product SQL  
16 Server® which is marketed by Microsoft Corporation, to store, among other  
17 things, the body of questions. Figures 3-8 illustrate one such order data  
18 organization comprising Learning Dimensions, Proficiency Levels, Topics,  
19 Questions, etc..

20

21

1 As shown in Figure 2, in another embodiment, the present invention is  
2 implemented as a networked system having at least one client (e.g., desktop,  
3 workstation, laptop, handheld, etc) in communication with at least one server  
4 (e.g., application, web, and/or database servers, etc.,) via a network, such as the  
5 Internet.

6  
7 The present invention utilizes a comprehensive curriculum map that outlines  
8 relational correlations between distinct base-level categories of mathematical  
9 topics, concepts and skill sets.

10

11 The present invention generates an individually tailored curriculum for each user,  
12 which is a result of the user's unique progression through the curriculum map, and  
13 is dynamically determined in response to the user's ongoing performance and  
14 proficiency measurements within each mathematical topic category. To illustrate  
15 the mechanisms behind this process, attention must first be paid to the  
16 mathematical topic category entity itself and its many features.

17

18 Each of the distinct mathematical topic category entities defined on the  
19 curriculum map is represented technically as an object, with a vast member  
20 collection of related exercise questions and solutions designed to develop skills  
21 and proficiency in the particular topic represented. Each category object also

1 maintains a Student-user Proficiency Level measurement that continually  
2 indicates each user's demonstrated performance level in that particular category.  
3 In addition, each category object also maintains a Question Difficulty Level that  
4 determines the difficulty of any questions that may be chosen from the object's  
5 question collection and presented to the user. As expected, the movement of an  
6 object's Question Difficulty Level is directly correlated to the movement of the  
7 Student-user Proficiency Level. Referring to Figure 9, conceptually, each  
8 category object may be depicted as a container, for example a water bucket. With  
9 this analogy, the height of the water level within each bucket could then represent  
10 the Student-user Proficiency Level, rising and falling accordingly. Directly  
11 correlated to the water level, the Question Difficulty Level may then be  
12 represented by graduated markings along the height of the bucket's inner wall,  
13 ranging from low difficulty near the bottom to high difficulty near the top. The  
14 rise and fall of the water level would therefore relate directly to the markings  
15 along the bucket's wall.  
16  
17 As a student-user answers questions from a particular bucket, their Proficiency  
18 Level in that topic area is gleaned from the accuracy of each answer, as well as  
19 their overall performance history and consistency in the category. In general, a  
20 correct answer will increase the user's proficiency measurement in that category,  
21 while an incorrect answer will decrease it. A bucket's water level therefore

1 responds to each of the user's attempts to solve a question from that bucket's  
2 collection. The issue left unresolved here is the incremental change in height  
3 applied to the bucket's water level with each answered question.

4

5 On a per question basis, the magnitude of the incremental change in Proficiency  
6 Level should vary, and will be determined by the user's recent performance  
7 history in the category, specifically the consistency of their demonstrated  
8 competence on previous questions from that bucket. Hence, a student-user who  
9 has answered most questions in a category correctly will be posed with  
10 progressively larger incremental increases in their Proficiency Level for an  
11 additional correct answer, and progressively smaller incremental decreases for an  
12 additional incorrect answer. The opposite conditions apply to a student-user that  
13 has answered most questions in a category incorrectly. A student-user whose  
14 performance history sits on the median will face an equally-sized increase or  
15 decrease in Proficiency Level for their next answer.

16

17 The bucket property that will track and update a user's performance history is the  
18 Student-user State rating. This rating identifies a user's recent performance  
19 history in a particular bucket, ranging from unsatisfactory to excellent  
20 competence. A student-user may qualify for only one State rating at a time. Each  
21 State rating determines the magnitude of incremental change that will be applied

1 to a user's Proficiency Level in that bucket upon the next answered question, as  
2 discussed in the previous paragraph. The user's performance on the next question  
3 will then update the user's recent performance history, and adjust the user's State  
4 accordingly before the next question is presented. In terms of the water bucket  
5 analogy, a user's State may be illustrated as a range of cups, each of a different  
6 size, which can add and remove varying amounts of water to and from the bucket.  
7 Before answering each question from a bucket, a student-user is equipped with a  
8 particular cup in one hand for adding water and a particular cup in the other hand  
9 for removing water, depending on the user's State. The potential incremental  
10 change in water level per question is therefore determined based on the user's  
11 State. As the user's State rating changes, so do the cup sizes in the user's hands.  
12  
13 Revisiting the discussed functionality of the Proficiency Level in each bucket, it  
14 becomes apparent that the full range of the Proficiency scale must be finite, and  
15 therefore some other mechanisms must come into play once a user's Proficiency  
16 Level in a bucket approaches the extreme boundaries of its defined range. It  
17 would be nonsensical to continue adding water to a bucket that is filled to the  
18 brim, or removing water from an empty bucket. Instead, approaching these  
19 extreme scenarios should trigger a specialized mechanism to either promote or  
20 demote the user's focus appropriately to another bucket. This is in fact the case,  
21 and the new mechanisms that take over in these situations will lead the discussion

1 into inter-bucket relationships and traversing the curriculum map's links between  
2 multiple buckets.

3

4 If a user's Proficiency Level in a particular bucket reaches a high enough level,  
5 the student-user then qualifies to begin learning about content and attempting  
6 questions from the "next" category bucket defined on the curriculum map.

7 Likewise, if a student-user demonstrates insufficient competence in a particular  
8 bucket, their Proficiency Level in that bucket drops to a low enough level to begin  
9 presenting the student-user with questions from the "previous" category bucket  
10 defined on the curriculum map. These upper and lower Proficiency Threshold  
11 Levels determine transitional events between buckets and facilitate the  
12 development of a user's personalized progression rate and traversal paths through  
13 the various conceptual categories on the curriculum map.

14

15 The direct relationships between category buckets on the curriculum map are  
16 defined based on parallel groupings of similar level concept topics, and  
17 prerequisite standards between immediately linked buckets of consecutive parallel  
18 groups. These relationships help to determine the general progression paths that  
19 may be taken from one bucket to the "next" or "previous" bucket in a curriculum.  
20 Beyond the simple path connections, buckets that are immediately linked in the  
21 curriculum map also carry a Correlation Index between them, which indicates



1    how directly the buckets are related, and how requisite the “previous” bucket’s  
2    material is to learning the content of the “next” bucket. These metrics not only  
3    determine the transition process between buckets, but also help to dynamically  
4    determine the probability of selecting questions from two correlated buckets as a  
5    student-user gradually traverses from one to the other (this selection functionality  
6    will be addressed shortly under the Question Selection Algorithm section).

7

8    Briefly summarizing, there are several levels of mechanisms operating on the  
9    curriculum map, both within each category bucket as well as between related  
10   category buckets. Within each bucket, a user’s performance generates  
11   Proficiency measurements, which set Difficulty Level ranges that ultimately  
12   determine the difficulty levels of questions selected from that particular category.  
13   Between related buckets, directly relevant topics are connected by links on the  
14   curriculum map, and characterized by Correlation Indexes that reflect how  
15   essential one topic is to learning another.

16

17

1 The present invention is a network (e.g., web-based) computer program product  
2 application comprising one or more client and server application modules. The  
3 client side application module communicates with the server side application  
4 modules, based on student-user input/interaction.

5

6 In one exemplary embodiment of the present invention, the client tier comprises a  
7 web browser application such as Internet Explorer™ by Microsoft™, and more  
8 specifically, a client application based on Flash animated graphics technology and  
9 format by Macromedia™.

10

11 In one exemplary embodiment of the present invention, the server tier comprises a  
12 collection of server processes including a Knowledge Assessment Test module, a  
13 Topic Selection module, and a Question Selection module. (collectively also  
14 called "Engine"), discussed below.

15

16

## 1 KNOWLEDGE ASSESSMENT MODULE

2

3 The Knowledge Assessment component has the following objectives:

4 · To efficiently identify for each student-user the most appropriate starting  
5 topic from a plurality of topics.

6 · To gauge student-user knowledge level across different learning  
7 dimensions.

8

9 The Knowledge Assessment comprises 3 phases:

10 · Phase 1 consists of several questions (e.g., 5-10) purely numerical  
11 questions designed to assess the user's arithmetic foundations.

12 · Phase 2 consists of a dynamic number (depending on user's success) of  
13 word problem-oriented numerical questions designed to gauge the user's  
14 knowledge of and readiness for the curriculum. The aim of Phase 2 is to quickly  
15 and accurately find an appropriate starting topic for each user.

16 · Phase 3 consists of several questions (e.g., 10-20) word problem-oriented  
17 questions designed to test the user's ability in all other learning dimensions. If the  
18 student-user exhibits particularly poor results in Phase 3, more questions may be  
19 posed

20

21 **Initial Test Selection**

1

2 In one embodiment, to enhance the system's intelligence, the system prompts the  
3 student-user for date of birth and grade information. After entering the requested  
4 date of birth and grade information, the system prompts the student-user with one  
5 of several (e.g., six) Phase 1 Tests, based on the following calculation:

6

7 Date of Birth is used to compute Age according to the following formula:

8

```
9      SecondsAlive = Number of seconds since midnight on the user's Date of
10      Birth
```

```
11 Age = Floor( SecondsAlive ÷ 31556736 )
```

12

13 Grade is an integer between 1 and 12.

14

15 The system determines an appropriate Test Number as follows: note that where  
16 grade and/or date of birth data is missing, the system uses predetermined logic.

17

18 If no data is known (Note: this case should not happen), then Test Number = 1

19

20 If only date of birth is known, then Test Number =  $\max\{1, \min\{\text{Age} - 5, 6\}\}$

21

1 If only grade is known (Note: this case should not happen), then Test Number =  
2  $\min\{ \text{Grade}, 6 \}$

3

4 If both date of birth and grade are known, then Test Number =  $\min\{ \text{Floor}([(2 \times$   
5  $\text{Grade}) + (\text{Age} - 5)] \div 3), 6 \}$

6

### 7 **Test Jumps**

8

9 Depending on the user's progress or level of proficiency, the student-user may  
10 jump from one test to another.

11

12

### 13 *Test Jump Logic*

14

15 If the student-user answers a certain number of consecutive questions correctly  
16 (incorrectly), the student-user will jump up (down) to the root node of the next  
17 (previous) test. The requisite number depends on the particular test and is hard-  
18 coded into each test. For example, a student-user starting in Test 1 must answer  
19 the first four Phase 2 questions correctly in order to jump to Test 2.

20

### 21 *Test Jump Caps*

1

2 If the student-user jumps up (down) from one Test to another, in one embodiment,  
3 the system will prevent the student-user from jumping back down (up) in the  
4 future to revisit a Test.

5

6 In another embodiment, the student-user may revisit a Test however, the user's  
7 starting topic is set to the highest topic answered successfully in the lower level  
8 Test. For example, referring to Figure 2, if the student-user jumps from Test 1 to  
9 Test 2, and then subsequently falls back to Test 1, the starting topic is set at the  
10 01N05 test, Phase 2 ends, and Phase 3 of the 01N05 test begins.

11

## 12 Test Progression

13

14 In one embodiment, a student-user proceeds through the Knowledge Assessment  
15 module linearly, beginning with Phase 1 and ending with Phase 3. Phase 1 and  
16 Phase 2 are linked to specific test levels. Phase 3 is linked to a specific Number  
17 topic, namely the Number topic determined in Phase 2 to be the user's starting  
18 topic. Two users who start with the same Phase 1 test will take at least part of the  
19 same Phase 2 test (though depending on their individual success, one may surpass  
20 the other and see more questions), but may take very different Phase 3 tests  
21 depending on their performance in Phase 2.

1

2 Knowledge Assessment Question Selection Approach

3

4 Each Knowledge Assessment question tests one or both of two skills: word  
5 problem-solving skill, and skill in one of the five other learning dimensions. The  
6 following variables are used for scoring purposes:

7

8 NScore – A running tally of the number of Number-related questions the student-  
9 user has answered correctly.

10 NTotal – A running tally of the number of Number-related questions the student-  
11 user has attempted.

12 PScore – A running tally of the number of Problem Solving-related questions the  
13 student-user has answered correctly.

14 PTotal – A running tally of the number of Problem Solving-related questions the  
15 student-user has attempted.

16 PSkill – Codes whether the question tests proficiency in Word Problems. In  
17 general, will be set to 0 for Phase 1 questions, and to 1 for Phase 2 and Phase 3  
18 questions

19

20 At the beginning of the Knowledge Assessment, all four of these variables are  
21 initialized to zero.

1

## 2   **Assessments Test Phases**

3   The various assessments tests consists of three phases, namely Phase 1, Phase 2  
4   and Phase 3.

5

### 6   **Phase 1**

7

#### 8   *Overview*

9   Phase 1 is used to assess the user's foundation in numerical problems.

10   Phase 1 consists of a predetermined number (e.g., 5-10) of hard-coded questions.

11   The system presents the questions to the student-user in a linear fashion..

12

#### 13   *Phase 1 Logic:*

14   1.   If the student-user answers a question correctly:

15       a.   NScore is increased by 1.

16       b.   NTotal is increased by 1.

17       c.   The student-user proceeds to the next question referenced in the  
18       question's   "Correct" field.

19

20   2.   If the student-user answers a question incorrectly:

21       a.   NScore is not affected.



1           b.     NTotal is increased by 1.

2           c.     The student-user proceeds to the next question referenced in the  
3           question's     "Incorrect" field.

4

## 5     **Phase 2**

### 6     *Overview*

7

8     Phase 2 establishes the user's starting topic. Phase 2 follows a binary tree  
9     traversal algorithm. See Figure #. Figure # depicts an exemplary binary tree  
10    representing Phase 2 of an Assessment Test 1. The top level is the root node. The  
11    bottom level is the placement level, where the user's starting topic is determined.  
12    All levels in between are question levels. Nodes that contain pointers to other  
13    Tests (indicated by a Test level and Phase number)(See #) are called jump nodes.  
14    Each Test Level Phase 2 tree looks look similar to Figure # with varying tree  
15    depths (levels).

16

17    An exemplary Phase 2 binary tree traversal algorithm is as follows:

18

19           Leftward movement corresponds to a correct answer. Rightward  
20    movement corresponds to an incorrect answer.

1       The topmost topic is the root node. This is where the student-user starts  
2 after finishing Phase 1. At the root node, the student-user is asked two questions  
3 from the specified topic. This is the only node at which two questions are asked.  
4 At all other nodes, only one question is asked.

5       At the root node, the student-user must answer both questions correctly to  
6 register a correct answer for that node (and hence move leftward down the tree).  
7 Otherwise, the student-user registers an incorrect answer and moves rightward  
8 down the tree.

9       The student-user proceeds in this manner down through each question  
10 level of the tree.

11       The student-user proceeds in this manner until he reaches the placement  
12 level of the tree. At this point, he either jumps to Phase 1 of the specified test (if  
13 he reaches a jump node) or the system registers a starting topic as indicated in the  
14 node.

15

16 *Phase 2 Logic:*

- 17 1. If the student-user answers a question correctly:
- 18       a. NScore increases by 1.
- 19       b. NTotal increases by 1.
- 20       c. If the question's Pskill is set to 1, then
- 21           i. PScore increases by 1.

- 1                   ii.     PTotal increases by 1.
- 2           d.     Else if the question's PSkill is set to 0, then
- 3                   i.     PScore is unaffected.
- 4                   ii.    PTotal is unaffected.
- 5           e.     The student-user proceeds to the next question referenced in the
- 6           question's "Correct" field.
- 7   2.    If the student-user answers a question incorrectly:
- 8           a.     NScore is unaffected.
- 9           b.     NTotal increases by 1.
- 10          c.     If the question's PSkill is set to 1, then
- 11                   i.     PScore is unaffected.
- 12                   ii.    PTotal increases by 1.
- 13          d.     Else if the question's PSkill is set to 0, then
- 14                   i.     PScore is unaffected.
- 15                   ii.    PTotal is unaffected.
- 16          e.     The student-user proceeds to the next question referenced in the
- 17          question's "Incorrect" field.

1           **Phase 3**

2

3   Phase 3 is designed to assess the user's ability in several learning dimensions  
4   (e.g., the Measure (M), Data Handling (D), Shapes and Space (S), and Algebra  
5   (A) learning dimensions) at a level commensurate with the user's starting Number  
6   topic determined in Phase 2. Phase 3 consists of a predetermined number of  
7   questions (e.g., 9-27) hard-coded to each starting Number topic. For example, if  
8   the user's starting Number topic is determined in Phase 2 to be 01N03, then the  
9   student-user is presented with an corresponding 01N03 Phase 3 test.

10

11   The Knowledge Assessment lookup tables contain 3 questions from each M, D, S,  
12   and A learning dimensions in the PLANETii curriculum.

13

14   Each Phase 3 test pulls questions from between 1 and 3 topics in each learning  
15   dimension.

16

17   *Phase 3 Logic:*

18

- 19   1.   If the student-user answers a question correctly:
- 20       a.   If the question's PSkill is set to 1, then
- 21           i.   PScore increases by 1.

- ii. PTotal increases by 1.
      - b. Else if the question's PSkill is set to 0, then
        - i. PScore is unaffected.
        - ii. PTotal is unaffected.
      - c. The student-user proceeds to the next question referenced in the question's "Correct" field.
    2. If the student-user answers a question incorrectly:
      - a. If the question's PSkill is set to 1, then
        - i. PScore is unaffected.
        - ii. The PTotal increases by 1.
      - b. Else if the question's PSkill is set to 0, then
        - i. PScore is unaffected.
        - ii. The PTotal is unaffected.
      - c. The student-user proceeds to the next question referenced in the question's "Incorrect" field.
  3. If the student-user answered all three questions in any topic incorrectly, the system provides a fallback topic at the end of Phase 3.

Each topic in the M, D, S, and A learning dimensions is coded with a fallback topic. If the student-user fails a topic, the student-user is given the

1 opportunity to attempt the fallback topic. For example, if a student-user answers  
2 all three questions in 03M01 (Length and Distance IV) incorrectly, after the  
3 student-user completes Phase 3, the system prompts the student-user with a  
4 suggestion to try a fallback topic, e.g., 01M03 (Length and Distance II).

5

## 6 DATA STORAGE OF KNOWLEDGE ASSESSMENT INFORMATION – 7 DATABASE ORGANIZATION

8

9 The content/questions used during the Knowledge Assessment module are  
10 stored in a main content-question database. One or more look up tables are  
11 associated with the database for indexing and retrieving knowledge assessment  
12 information. Exemplary knowledge assessment lookup tables comprise the  
13 following fields A-W and optionally fields X-Y:

14

15 Field A: AQID

16 Field A contains the Knowledge Assessment Question ID code (AQID). This  
17 should include the Test level (01-06, different for Phase 3), Phase number (P1-  
18 P3), and unique Phase position (see below). Each of the three Phases has a  
19 slightly different labeling scheme. For example: 01.P1.05 is the fifth question in  
20 Phase 1 of the Level 1 Knowledge Assessment; 03.P2.IIC2 is the third question  
21 that a student-user would see in Phase 2 of the Level 3 Knowledge Assessment

1 following an Incorrect and a Correct response, respectively; and 01N03.P3.02 is  
2 the second question in the 01N03 Phase 3 Knowledge Assessment.

3 Field B: QID

4 Field C: Topic Code

5 Field D: Index

6 Field E: PSL

7 Field F: Question Text

8 -Fields B-F are pulled directly from the main content-question database and are  
9 used for referencing questions.

10 Field G: Answer Choice A Text

11 Field H: Answer Choice B Text

12 Field I: Answer Choice C Text

13 Field J: Answer Choice D Text

14 Field K: Answer Choice E Text

15 -Fields G-K contain the five possible Answer Choices (a-e).

16 Field L : Correct Answer Text.

17 Fields M-Q contain Incorrect Answer Explanations corresponding to the Answer  
18 Choices in fields G-K. The field corresponding to the correct answer is grayed-  
19 out.

20 Field R: Visual Aid Description - The Visual Aid Description is used by

21 Content to create Incorrect Answer Explanations.

- 1 Field S: Correct – A pointer to the QID of the next question to ask if the  
2 student-user answers the current question correctly.
- 3 Field T: Incorrect – A pointer to the QID of the next question to ask if the  
4 student-user answers the current question incorrectly.
- 5 Field U: NSkill – 0 or 1. Codes whether the question involves Number skill.  
6 Used for scoring purposes.
- 7 Field V: PSkill – 0 or 1. Codes whether the question involves Word  
8 problem skill. In general, will be set to 0 for Phase 1 questions, and to 1 for Phase  
9 2 and Phase 3 questions. Used for scoring purposes.
- 10 Field W: LDPoint – 1, 1.2, or 1.8 points for questions in Phase 3, blank for  
11 questions in Phase 1 and Phase 2. Depends on PSL of question and is used for  
12 evaluation purposes.
- 13 Field X: Concepts – Concepts related to the question material. May be used  
14 for evaluation purposes in the future.
- 15 Field Y: Related Topics – Topics related to the question material. May be  
16 used for evaluation purposes in the future.

17

18



1    FORMULAS FOR TEST SCORING

2

3    During the Knowledge Assessment Test module, the system calculates several  
4    scores as follows:

5

6    The user's number score in the Numbers learning dimension is calculated via the  
7    following formula:

8

9             $\text{Number Score} = \min[ \text{Floor} \{ [\text{NScore} / (\text{NTotal} - 1)] * 5 \}, 5 ]$

10

11    The user's score in other learning dimensions (e.g., Measure, Data Handling,  
12    Shapes and Space and Algebra) is calculated as follows:

13

14            First, a score is computed in each topic. In each Measure, Data Handling,  
15    Shapes and Space and Algebra learning dimension, there are three questions, one  
16    each with a LDPoint value of 1, 1.2, and 1.8. The user's topic score is calculated  
17    via the following formula:

18

19             $\text{Topic Score} = \text{Round} \{ \text{Sum of LDPoints of All 3 Questions} * (5/4) \}$

20

1 All Topic Scores in a given Learning Dimension are averaged (and floored) to  
2 obtain the Learning Dimension Score.

3

4 Finally, the user's word problem score is calculated using the following formula:

5

6 
$$\text{Word Problem Score} = \min[ \text{Floor}\{[\text{PScore} / (\text{PTotal} - 1)] * 5\}, 5 ]$$

7

## 8 EVALUATION OF KNOWLEDGE ASSESSMENT RESULTS

9

### 10 *Overview*

11 At the end of the Knowledge Assessment module, the system prompts the  
12 student-user student-user to log out and the parent/instructor to log in to access  
13 test results. The system then presents the parent/instructor with a screen relaying  
14 the following evaluation information: 1) the name of each of the learning  
15 dimensions (currently, five) in which the student-user student-user was tested is  
16 listed, along with a 0-5 scale displaying the user's performance and 2) the user's  
17 "Word Problem Skill" is assessed on a 0-5 scale.

18

19 The parent/instructor can then select a learning dimension or the "Word  
20 Problem Skill" to see all relevant questions attempted by the student-user user,  
21 along with incorrect answers and suggested explanations.

1

2 *Evaluation Standards*

3       Using an exemplary 0-5 scale, a 5 corresponds to full proficiency in a  
4       topic. If a student-user scores a 5 in any learning dimension or in word problem  
5       solving, the system displays the following message: "[Child Name] has  
6       demonstrated full proficiency in [Topic Name]."

7

8       A 3-4 corresponds to some ability in that topic. If a student-user scores a  
9       3-4 in any learning dimension or in word problem-solving, the system displays  
10      the following message: "[Child Name] has demonstrated some ability in [Topic  
11      Name]. PLANETii system will help him/her to achieve full proficiency."

12

13      A 0-2 generally means that the student-user is unfamiliar with the topic  
14      and needs to practice the material or master its prerequisites.

15

16      Full proficiency in a topic is defined as ability demonstrated repeatedly in  
17      all questions in the topic. In the current implementation described herein, a  
18      student-user has full proficiency only when he/she answers every question  
19      correctly.

20

1           Some ability in a topic is defined as ability demonstrated repeatedly in a  
2 majority of questions in the topic. In the current implementation, the student-user  
3 must answer 2 of 3 questions in any topic correctly.

4

5

#### 6       INITIALIZATION OF WATER LEVELS

7

8           After completion of the Knowledge Assessment Test module, the water  
9 levels of the user's starting topic, any pre-requisites and related topics are  
10 initialized (pre-assigned values) according to the following logic:

11

- 12       ▪ The water level in the user's starting topic is not initialized.
- 13       ▪ The water level in any Number topics that are pre-requisites (with a high  
14 correlation coefficient (NEW) to the user's starting topic is initialized to  
15 85.
- 16       ▪ For the other learning dimensions, topics are organized into subcategories.

17

18       Consider the following example where one family of topics organized into related  
19 sub-topic categories include:

- 20           1.     01M01 Length and Distance I
- 21           2.     01M03 Length and Distance II

1                   3.     02M01 Length and Distance III

2                   4.     03M01 Length and Distance IV

3     Suppose a user, after completing the Knowledge Assessment Test module, is  
4     tested in topic 03M01 Length and Distance IV: if his/her topic score in 03M01  
5     Length and Distance IV is 5, then a). the water level in 03M01 Length and  
6     Distance IV is set to 85 and b) the water level in related topics 01M01 Length and  
7     Distance I, 01M03 Length and Distance II, 02M01 02M01 Length and Distance  
8     III is set to 85.

9             If his/her topic score in 03M01 Length and Distance IV is 4, then a) the  
10    water level in 03M01 Length and Distance IV is set to 50; and b) the water level  
11    in related topics 01M01 Length and Distance I, 01M03 Length and Distance II,  
12    02M01 Length and Distance III is set to 85.

13            If his/her topic score in 03M01 Length and Distance IV is 3 or below, then  
14    a) the water level in 03M01 Length and Distance IV is not initialized; b) the water  
15    level in related topic 02M01 Length and Distance III is not initialized; and c) the  
16    water level in any related topic in the subcategory at least twice removed from  
17    03M01 Length and Distance IV (in this case, 01M01 Length and Distance I and  
18    01M03 Length and Distance II) is initialized to 85.

19            The water level for a given topic can be assigned during initialization or  
20    after a student-user successfully completes a topic. Thus, a pre-assigned water  
21    level of 85 during initialization is not the same as an earned water level of 85 by

1 the user. Therefore, a student-user can fall back into a topic with a pre-assigned  
2 water level of 85 if need be.

3

#### 4 TOPIC SELECTION ALGORITHM MODULE

5

6 The Topic Selection module is a three step multi-heuristic intelligence algorithm  
7 which assesses the eligibility of topics and then ranks them based on their  
8 relevance to a given student's past performance. During step one, the Topic  
9 Selection module prunes (culls) the list of uncompleted topics to exclude those  
10 topics which are not relevant to the student's path and progress. During step two,  
11 the Topic Selection module evaluates each eligible topic for relevance using the  
12 multi-heuristic ranking system. Each heuristic contributes to an overall ranking of  
13 relevance for each eligible topic and then the topics are ordered according to this  
14 relevance. During step three, the Topic Selection module assesses the list of  
15 recommendations to determine whether to display the recommended most  
16 relevant topics.

17

18 FIG. 11 depicts an exemplary process flow for the Topic Selection Algorithm  
19 module.

20

21 *Step 1 - Culling eligible topics*

1

2       The Topic Selection module employs several culling mechanisms which  
3       allow for the exclusion of topics based on the current state of a user's curriculum.

4       The topics that are considered eligible are placed in the list of eligible topics.

5       The first step includes all topics that have an eligibility factor greater than 0, a  
6       water level less than 85 and no value from the placement test. This ensures that  
7       the student-user will not enter into a topic that they are not ready for or one that  
8       they have already completed or tested out of. The last topic a student-user  
9       answered questions in is explicitly excluded from the list which prevents the  
10       engine from recommending the same topic twice in a row particularly if the  
11       student-user fails out of the topic.

12       After these initial eligibility assertions take place, some additional considerations  
13       are made. If there are any topics that are current failed in the user's curriculum, all  
14       of the uncompleted pre-requisites of these topics are added to the eligible list.

15       This includes topics that received values from the placement test.

16       Finally, if there are no failed topics in the student's curriculum and all the topics  
17       in the recommendation list that are greater than 1 level away from the student's  
18       average level, the list is cleared and no topics are included. This will indicate a  
19       "Dead End" situation.

20

21       *Step 2 - Calculating Relevance*

1

2 After the list of eligible topics has been compiled, the Topic Selection module  
3 calculates a relevance score for each topic. The relevance score is calculated  
4 using several independent heuristic functions which evaluate various aspects of a  
5 topic's relevance based upon the current state of the user's curriculum. Each  
6 heuristic is weighted so that the known range of its values can be combined with  
7 the other heuristics to provide an accurate relevance score. The weights are  
8 designed specifically for each heuristic so that one particular relevance score can  
9 cancel or compliment the values of other heuristics. The interaction between all  
10 the heuristics creates a dynamic tension in the overall relevance score which  
11 enables the recognition of the most relevant topic for the student-user based on  
12 their previous performance.

13

#### 14 *Relevance Heuristics Explained*

15

##### 16 1) Average Level Relevance

###### 17 Overview:

18 This heuristic determines a student's average overall level and then  
19 rewards topics which are within a one-level window of the average while  
20 punishing topics that are further away.

21



1 Formula:

2 For each level:

3

4  $\text{LevelAverage} = \text{sum}(\text{topicWaterLevel} * \text{topicLevel}) / \text{sum}(\text{topicLevel})$

5  $\text{Average Level} = \text{Sum}(\text{LevelAverage})$

6 Topic relevance:  $(0.5 - \text{ABS}(\text{topicLevel} - \text{Average Level})) * 5$

7

8 Range of Possible Values:

9 (in current curriculum 1-4): 2.5 to -17.5

10

11 Weighted Range of Possible Values:

12 (in current curriculum 1-4): 7.5 to -52.5

13

14 2) Eligibility Relevance

15 Overview:

16 This heuristic assesses the student's readiness for the topic, found by determining  
17 how much of each direct pre-requisite a student-user has completed.

18

19 Formula:

20

21 If  $W(\text{PrqN}) \geq 85$ , then set  $W(\text{PrqN}) = 85$ ;

1

2

3

4 wherein:  $E(X)$  be the Eligibility Index of Bucket X,5  $W(\text{PrqN})$  be the Water Level of Pre-requisite N of Bucket X6  $\text{Cor}(X, \text{PrqN})$  be the Correlation Index between Bucket X and its

7 Pre-requisite N, where N is the number of pre-requisite buckets

8 for X

9 t be the constant 100/85

10

11 Range of Possible Values:

12 (in current curriculum 1-4): 100 to 0

13

14 Weighted Range of Possible Values:

15 (in current curriculum 1-4): 20 to 0

16

17 3) Concept Importance (Static Multiplier) Relevance

18 Overview:

19 Concept importance is a predetermined measure of how important a topic is. For

20 example, a topic like "Basic Multiplication" is deemed more important than "The

21 Four Directions."

1

2   Formula:

3    $1 - (\text{Topic Multiplier})$

4

5   Range of Possible Values:

6   (in current curriculum 1-4): 1 to 0

7

8   Weighted Range of Possible Values:

9   (in current curriculum 1-4): 5 to 0

10

11   4) Contribution Relevance

12   Overview:

13   This heuristic measures the potential benefit completing this topic would provide,  
14   by adding its post-requisites' correlations.

15

16   Formula:

17    $\text{SUM}(\text{post requisite correlation})$

18

19   Range of Possible Values:

20   (in current curriculum 1-4): ~6 to 0

21

1    **Weighted Range of Possible Values:**

2    (in current curriculum 1-4): ~3 to 0

3

4    **5) Learning Dimension Repetition Relevance**

5    **Overview:**

6    This heuristic is meant to ensure a degree of coherence to the student-user while

7    developing a broad base in multiple learning dimensions. The heuristic favors 2

8    consecutive topics in a particular learning dimension, and then gives precedence

9    to any other learning dimension, so a student-user doesn't overextend his/her

10   knowledge in any one learning dimension.

11

12   **Formula:**

13   This heuristic uses a lookup table (see below) of values based on the number of

14   consecutive completed topics in a particular learning dimension.

15

16    1) Repetitions	2) 0	3) 1	4) 2	5) 3	6) 4	7) 5	8) 6	9) 7	10) 8
17    11) Value	12) 2	13) 7.5	14) -1	15) -5	16) -9	17) -12	18) -17	19) -22	20) -27
18									
19									

20

21

1 Range of Possible Values:

2 (in current curriculum 1-4): 7.5 to -27.5

3

4 Weighted Range of Possible Values:

5 (in current curriculum 1-4): 9.38 to -34.375

6

7 6) Failure Relevance

8 Overview:

9 This heuristic gives a bonus to topics that are important pre-requisites to  
10 previously failed topics. For example, if a student-user fails 01M01 (Length and  
11 Distance I), then the pre-requisites of 01M01 will receive a bonus based on their  
12 correlation to 01M01. It treats assessment test topics differently than the normal  
13 unattempted topics and weights the bonuses it gives to each according to the  
14 balance of the correlation between these prerequisites. For example, an  
15 assessment test topic's correlation to the failed topic must be higher than the sum  
16 of the other unattempted topics or it receives no bonus. All unattempted topics  
17 receive a bonus relative to their correlation to the failed topic.

18

19 Formula:

20 get the kid/bucket data

21 loop through the failed topics

1   get this failed topic ID  
2   get the topic data for the failed topic ID  
3   if we are a pre-req of the failed topic  
4   sum the unattempted pre-req buckets' correlations  
5   if the AT topic's correlation is higher than the sum of the unattempted pre-reqs  
6   add  $5 + (5 * \text{our correlation} - \text{the unattempted sum})$  to the bonus  
7   otherwise return nothing  
8   otherwise return  $10 * \text{the pre-req's correlation}$   
9   return the bonus  
10  
11   Range of Possible Values:  
12   (in current curriculum 1-4): 10 to 0  
13  
14   Weighted Range of Possible Values:  
15   (in current curriculum 1-4): 10 to 0  
16  
17   7) Additional Failure (Re-Recommend) Relevance  
18   Overview:  
19   This heuristic promotes failed topics if the student-user has completed most of the  
20   pre-requisite knowledge, and demotes topics for which a high percentage of the

1 pre-requisite knowledge has not been satisfied. If the last topic completed was a  
2 pre-requisite of this failed topic, this topic receives a flat bonus.

3

4 Formula:

5  $\text{score} += (80 - EI) / 10;$

6  $\text{if}(\text{preReq.equals}(\text{EngineUtilities.getLastBucket}(\text{userId}))) \{ \text{score} += 3; \}$

7

8 Range of Possible Values:

9 (in current curriculum 1-4): 11 to -2

10

11 Weighted Range of Possible Values:

12 (in current curriculum 1-4): 11 to -2

13

14  $\text{public double calculateRelevance}(\text{String userId}, \text{String topicId}) \{$

15  $\text{double score} = 0;$

16  $\text{// get the kid/bucket data}$

17  $\text{KidBucketWrapper kbw} = \text{new KidBucketWrapper}(\text{userId}, \text{topicId});$

18  $\text{// loop through the failed topics}$

19  $\text{for}(\text{Iterator } i = \text{curriculum.getFailedTopics}(\text{userId}).\text{iterator}(); i.\text{hasNext}();) \{$

20  $\text{// get this failed topic Id}$

21  $\text{String fTopicId} = (\text{String})i.\text{next}();$

```
1  // get the Topic data for the failed topic id
2  Topic fTopic = curriculum.getTopic(fTopicId);
3  // if we are a pre-req of the failed topic
4  if(fTopic.getPreRequisite(topicId) != null) {
5  // if we are an AT topic
6  if(kbw.getAssessmentLevel() > 0) {
7  double preSum = 0;
8  // sum the unattempted pre-req buckets' corellations
9  for(Iterator i2 = fTopic.getPreRequisites(); i2.hasNext(); ) {
10 String pre = (String)i2.next();
11 Topic preTopic = curriculum.getTopic(pre);
12 KidBucketWrapper prebw = new KidBucketWrapper(userId, pre);
13 If(!pre.equals(topicId) && prebw.getAssessmentLevel() == 0 &&
14 prebw.getWaterLevel() == 0) {
15 preSum += preTopic.getPostRequisite(fTopicId).getCorrelationCoefficient();
16 }
17 }
18
19 // if the AT topic's corellation is higher than the sum of the unattempted pre-reqs
20 if(fTopic.getPreRequisite(topicId).getCorrelationCoefficient() > preSum) {
21 // add 5 + (5 * our correlation - the unattempted sum) to the bonus
```



```
1  score += 5 + (5 * (fTopic.getPreRequisite(topicId).getCorrelationCoefficient() -
2  preSum));
3  }
4  // otherwise return nothing
5  else {
6  return 0;
7  }
8  }
9  // otherwise return 10 * the pre-req's correlation
10 else {return 10 * fTopic.getPreRequisite(topicId).getCorrelationCoefficient();
11 }
12 }
13 },
14 // return the bonus
15 return score;
16 }
17
18 Step 3 – Assess Recommendations
19     During the third and final step, the system assesses the list of
20 recommendations to determine whether to display the recommended most
21 relevant topics.
```

## 1 ELIGIBILITY INDEX

2

3 The Eligibility Index represents the level of readiness for the bucket to be chosen.

4 In other words, we ask the question "How ready is the student-user to enter into

5 this bucket?" Hence, the Eligibility Index of a bucket is a measure of the total

6 percentage of pre-requisites being completed by the user. The Eligibility Index is

7 calculated as follow:

8

9 Let  $E(X)$  be the Eligibility Index of Bucket X,10 Let  $W(\text{PrqN})$  be the Water Level of Pre-requisite N of Bucket X11 Let  $\text{Cor}(X, \text{PrqN})$  be the Correlation Index between Bucket X and its Pre-requisite

12 N, where N is the number of pre-requisite buckets for X

13 Let t be the constant 100/85

14

15 If  $W(\text{PrqN}) \geq 85$ , then set  $W(\text{PrqN}) = 85$ ;

16

$$17 \quad E(X) = \frac{\sum_{N=1}^N [t * W(\text{PrqN}) * \text{Cor}(X, \text{PrqN})]}{\sum_{N=1}^N \text{Cor}(X, \text{PrqN})}$$

18

19

20

1 To increase the effectiveness of choosing an appropriate bucket for the user, we  
2 introduce a new criteria called Eligibility Index Threshold. If the eligibility index  
3 does not reach the Eligibility Index Threshold, then the bucket is considered not  
4 ready to be chosen.

5

#### 6 Summary of Relevant Numbers for Implementation

- 7 1. Question selection starts at Water Level 25 for any new bucket
- 8 2. Proficiency Range (Water Level Range) is 0 to 100
- 9 3. Lower Threshold = 10
- 10 4. Upper Threshold = 85
- 11 5. Force Jump Backward at Water Level 0
- 12 6. Force Jump Forward at Water Level 100
- 13 7. Eligibility Index Threshold = 80

14

#### 15 *Ranking and special case recognition*

16

17 Once the relevance has been calculated for each eligible topic, the Topic Selection  
18 module recommends the two most relevant topics. If there are no topics to  
19 recommend (i.e the Culling phase eliminated all possible recommendations), one  
20 of two states is identified. The first state is called "Dead Beginning" and occurs  
21 when a student-user fails the 01N01 "Numbers to 10" topic. In this case, the

1 student-user is not ready to begin using the Smart Practice training and a message  
2 instructing them to contact their parent or supervisor is issued. The second state  
3 is called "Dead End" and occurs when a student-user has reached the end of the  
4 curriculum or the end of the available content. In this case, the student-user has  
5 progressed as far as possible and an appropriate message is issued.

## 6 QUESTION SELECTION MODULE

7

### 8 *Overview*

9 Once a topic has been determined for the student-user, the Question Selection  
10 Module delivers an appropriately challenging question to the student-user. In  
11 doing so, the Question Selection Module constantly monitors the student-user's  
12 current water level and locates the question(s) that most closely matches the  
13 difficulty level the student-user is prepared to handle. Since water level and  
14 difficulty level are virtually synonymous, this means that a student-user currently  
15 at (for example) water level 56 should get a question at difficulty level 55 before  
16 one at difficulty level 60. If the student-user answers the question correct, his/her  
17 water level increases by an appropriate margin; if he/she answers incorrectly,  
18 his/her water level will decrease.

19

20 Additionally, the Question Selection Module provides that all questions in a topic  
21 should be exhausted before delivering a question the student-user has previously

1 answered. If all of the questions in a topic have been answered, the Question  
2 Selection Module will search for and deliver any incorrectly answered questions  
3 before delivering correctly answered questions. Alternatively and preferably, the  
4 system will have an abundance of questions in each topic, therefore, it is not  
5 anticipated that student-users will see a question more than once.

#### 6 *Question Search Process*

7 All questions are each assigned a specific difficulty level from 1-100. Depending  
8 on the capabilities of the system processor(s), the system may search all of the  
9 questions for the one at the closest difficulty level to a student-user's current  
10 water level. Alternatively, during the search process, the system searches within a  
11 pre-set range around the student-user's water level. For example, if a student-  
12 user's water level is 43, the system will search for all the questions within 5  
13 difficulty levels (from 38 to 48) and will select one at random for the student.

14  
15 The threshold for that range is a variable that can be set to any number. The  
16 smaller the number, the tighter the selection set around the student's water level.  
17 The tighter the range, the greater the likelihood of finding the most appropriate  
18 question, but the greater the likelihood that the system will have to search  
19 multiple times before finding any question.

20

21 General Flow

- 1 1. Get the student's current water level
- 2 2. Search the database for all questions within (+ or -) 5 difficulty levels of
- 3 the student's water level. (NOTE: This threshold + or - 5 can become tighter to
- 4 find more appropriate questions, but doing so will increase the demands on the
- 5 processor.)
- 6 3. Serve a question at random from this set.
- 7 4. Depending on the student's answer, adjust his/her water level according to
- 8 the water level adjustment table.
- 9 5. Repeat the process.

10

#### 11 Governing Guidelines

- 12 1. Questions should be chosen from difficulty levels closest the student's
- 13 current water level. If no questions are found within the stated threshold (in our
- 14 example, + or - 5 difficulty levels), the algorithm will continue to look further and
- 15 further out (+ or - 10, + or - 15, and so on).
- 16 2. A previously answered question should not be picked again for any
- 17 particular student-user unless all the possible questions in the topic have been
- 18 answered.
- 19 3. If all questions in a topic have been answered, search for the closest
- 20 incorrectly answered question.

1 4. If all questions have been answered correctly, refresh the topic and start  
2 again.

3

4 Figure 15 depicts an exemplary process flow for picking a question from a  
5 selected topic-bucket.

6

#### 7 STATE LEVEL AND WATER LEVEL CALCULATIONS

8

9 A State Level indicates the student's consistency in performance for any bucket.

10 When a student-user answers a question correctly, the state level will increase by

11 1, and similarly, if a student-user answers incorrectly, the state level will decrease

12 by 1. Preferably, the state level has a range from 1 to 6 and is initialized at 3.

13

14 A Water Level represents a student's proficiency in a bucket. Preferably, the

15 water level has a range from 0 to 100 and is initialized at 25 when a student-user

16 enters a new bucket.

17

18 A Bucket Multiplier is pre-determined for each bucket depending on the

19 importance of the material to be covered in the bucket. The multiplier is applied

20 to the increments/decrements of the water level. If the bucket is a major topic, the

21 multiplier will prolong the time for the student-user to reach Upper Threshold. If

1 the bucket is a minor topic, the multiplier will allow the student-user to complete  
2 the topic quicker.

3

4 To locate the corresponding water level from the user's current question to the  
5 next question, the adjustment of the water level based on the current state of the  
6 bucket is as follows:

7

State Level that the student-user is currently in:	Adjustment in water level when a question is answered correctly:	Adjustment of water level when a question is answered incorrectly:
1	+0m	-5m
2	+1m	-3m
3	+1m	-2m
4	+2m	-1m
5	+3m	-1m
6	+5m	-0m
m = Bucket Multiplier		

8

9

## 10 DATA TRANSFER

11

12 The communications are handled securely, using a 128-bit SSL Certificate signed  
13 with a 1024-bit key. This is currently the highest level of security supported by  
14 the most popular browsers in-use today.

15



1 The data that is exchanged between the client and server has 2 paths: 1) from the  
2 server to the client, and 2) from the client to the server. The data sent from the  
3 client to the server is sent as a POST method. There are two main ways to send  
4 information from a browser to a web server, GET and POST. POST is the more  
5 secure method. The data sent from the server to the client is sent via the  
6 Extensible Markup Language (XML) format, which is widely accepted as the  
7 standard for exchanging data. This format was chosen because of its flexibility,  
8 and allows the system to re-use, change, or extend the data being used more  
9 quickly and efficiently.

10

## 11 CONCLUSION

12 Having now described one or more exemplary embodiments of the invention, it  
13 should be apparent to those skilled in the art that the foregoing is illustrative only  
14 and not limiting, having been presented by way of example only. All the features  
15 disclosed in this specification (including any accompanying claims, abstract, and  
16 drawings) may be replaced by alternative features serving the same purpose, and  
17 equivalents or similar purpose, unless expressly stated otherwise. Therefore,  
18 numerous other embodiments of the modifications thereof are contemplated as  
19 falling within the scope of the present invention as defined by the appended  
20 claims and equivalents thereto.

21

1 Moreover, the techniques may be implemented in hardware or software, or a  
2 combination of the two. In one embodiment, the techniques are implemented in  
3 computer programs executing on programmable computers that each include a  
4 processor, a storage medium readable by the processor (including volatile and  
5 non-volatile memory and/or storage elements), at least one input device and one  
6 or more output devices. Program code is applied to data entered using the input  
7 device to perform the functions described and to generate output information.  
8 The output information is applied to one or more output devices.

9  
10 Each program is preferably implemented in a high level procedural or object  
11 oriented programming language to communicate with a computer system,  
12 however, the programs can be implemented in assembly or machine language, if  
13 desired. In any case, the language may be a compiled or interpreted language.

14  
15 Each such computer program is preferably stored on a storage medium or device  
16 (e.g., CD-ROM, NVRAM, ROM, hard disk, magnetic diskette or carrier wave)  
17 that is readable by a general or special purpose programmable computer for  
18 configuring and operating the computer when the storage medium or device is  
19 read by the computer to perform the procedures described in this document. The  
20 system may also be considered to be implemented as a computer-readable storage

1 medium, configured with a computer program, where the storage medium so  
2 configured causes a computer to operate in a specific and predefined manner.

3

4 Finally, an embodiment of the present invention having potential commercial  
5 success is integrated in the Planetii™ Math System™, an online math education  
6 software product, available at <<http://www.planetii.com/home/>>.

7

8 Figure 14 depicts an exemplary user interface depicting the various elements for  
9 display. As shown, the question text data is presented as Display Area 2, the  
10 potential answer choice(s) data is presented as Display Area 4, the correct answer  
11 data is presented as Display Area 6, the Visual Aid data is presented as Display  
12 Area 8 and the Descriptive Solution data is presented as Display Area 10.

13

## 1 CLAIMS

2

3 What is claimed is:

4

5 1. An adaptive learning system for presenting an appropriate topic and question  
6 to a user, said system comprising:

7

8 a processor configured to:

9

10 generate and store in a database a set of hierarchical topics having a plurality of

11 questions associated with each one of said topics; each of said plurality of

12 questions within a topic having an assigned difficulty level value;

13

14 determine an adjustable state level value for a user based on said user's topic

15 performance consistency; said state level initialized to and having a range of

16 predetermined value;

17

18 determine an adjustable water level value for said user based on said user's

19 proficiency in at least a subset of said hierarchical topics; said water level

20 initialized to and having a range of predetermined value;

1     determine a relevant topic for said user from said set of hierarchical topics by  
2     performing the following:  
3  
4         cull said set of hierarchical topics to determine one or more eligible  
5         academic topics; and  
6  
7         evaluate for relevance said one or more eligible academic topics using  
8         heuristic relevance ranking to determine said relevant academic topic;  
9  
10    determine an appropriate question for said user from said plurality of relevant  
11    academic topic questions by performing the following:  
12  
13        determine said user's water level,  
14  
15        search said database for one or more questions within a threshold range  
16        from said user's water level,  
17  
18        randomly select a relevant question from this one or more questions  
19  
20        depending on the user's answer to said selected question, adjust said user's  
21        water level according to a predetermined adjustment table.

2. The system as in claim 1 wherein said processor is further configured to evaluate for relevance said one or more eligible academic topics using at least one of a Average Level Relavance heuristic, Eligibility Relevance heuristic, Static Multiplier Relevance heuristic, Contribution Relevance heuristic, Learning Dimension Repetition Relevance heuristic, Failure Relevance heuristic and Re-recommend Failure Relevance heuristic.

3. The system as in claim 1 wherein said processor further defines a multiplier value  $m$ , said state level value is initialized to 3 and ranging from 1 to 6, said water level value is initialized to 25 and ranging from 0 to 100 and said predetermined adjustment table comprises:

State Level that said user is currently in:	Adjustment in water level when a question is answered correctly:	Adjustment of water level when a question is answered incorrectly:
1	+0m	-5m
2	+1m	-3m
3	+1m	-2m
4	+2m	-1m
5	+3m	-1m
6	+5m	-0m
$m$ = Multiplier		

1 4. The system as in claim 1 wherein said difficulty level value ranges from 1 to  
2 100;

3

4 5. The system as in claim 1 wherein said threshold range is from  $\pm 0$  to  $\pm 5$ .

5

6 6. The system as in claim 1 wherein said threshold range is greater than  $\pm 5$ .

7

8

FIGURE 1

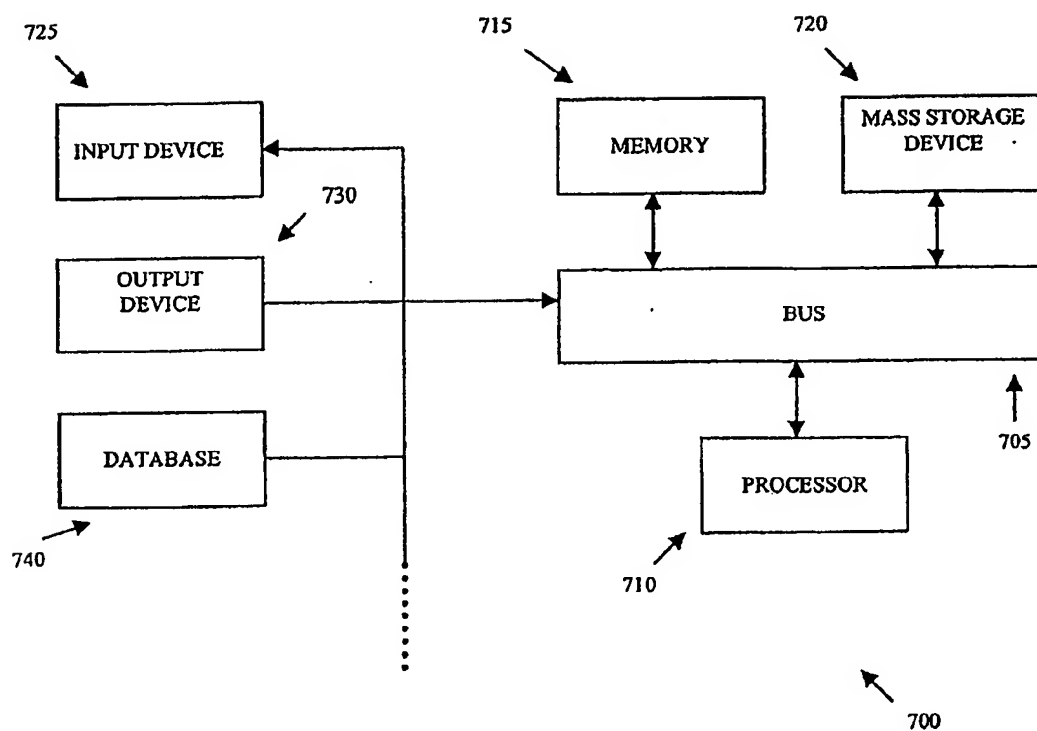
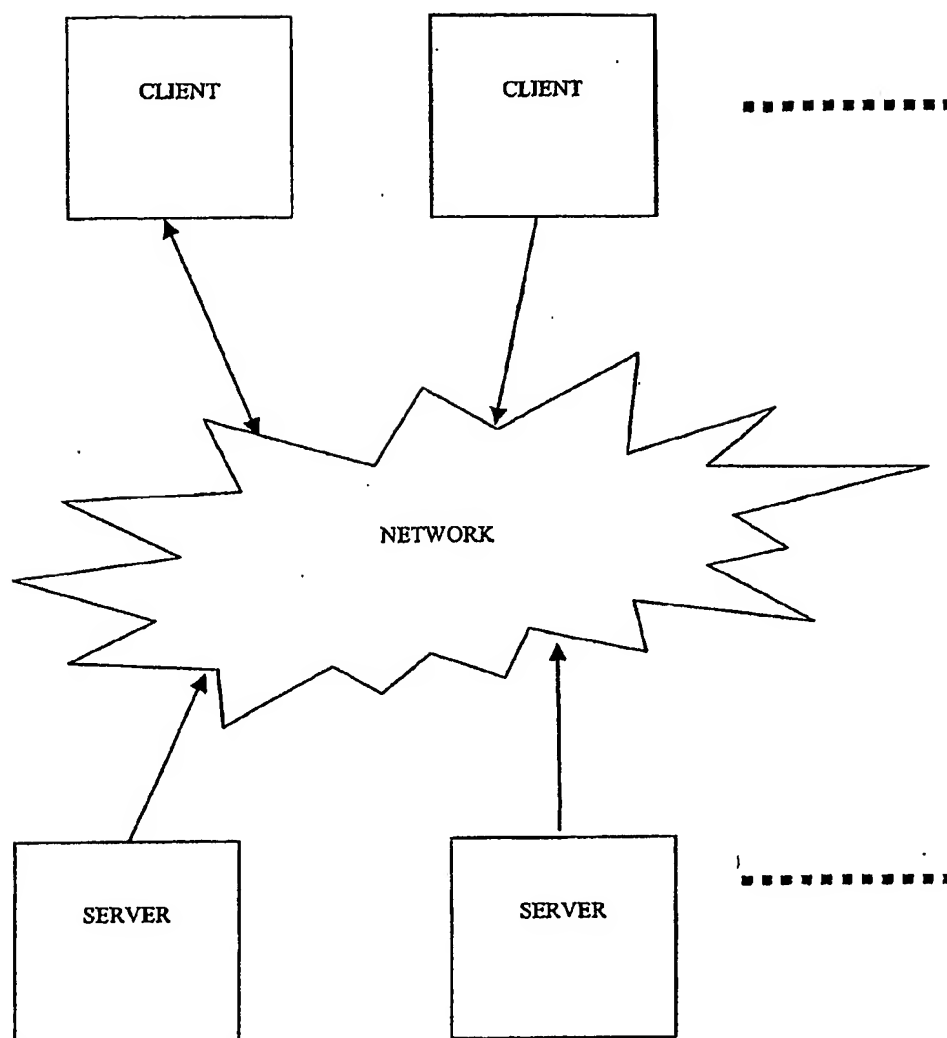




FIGURE 2



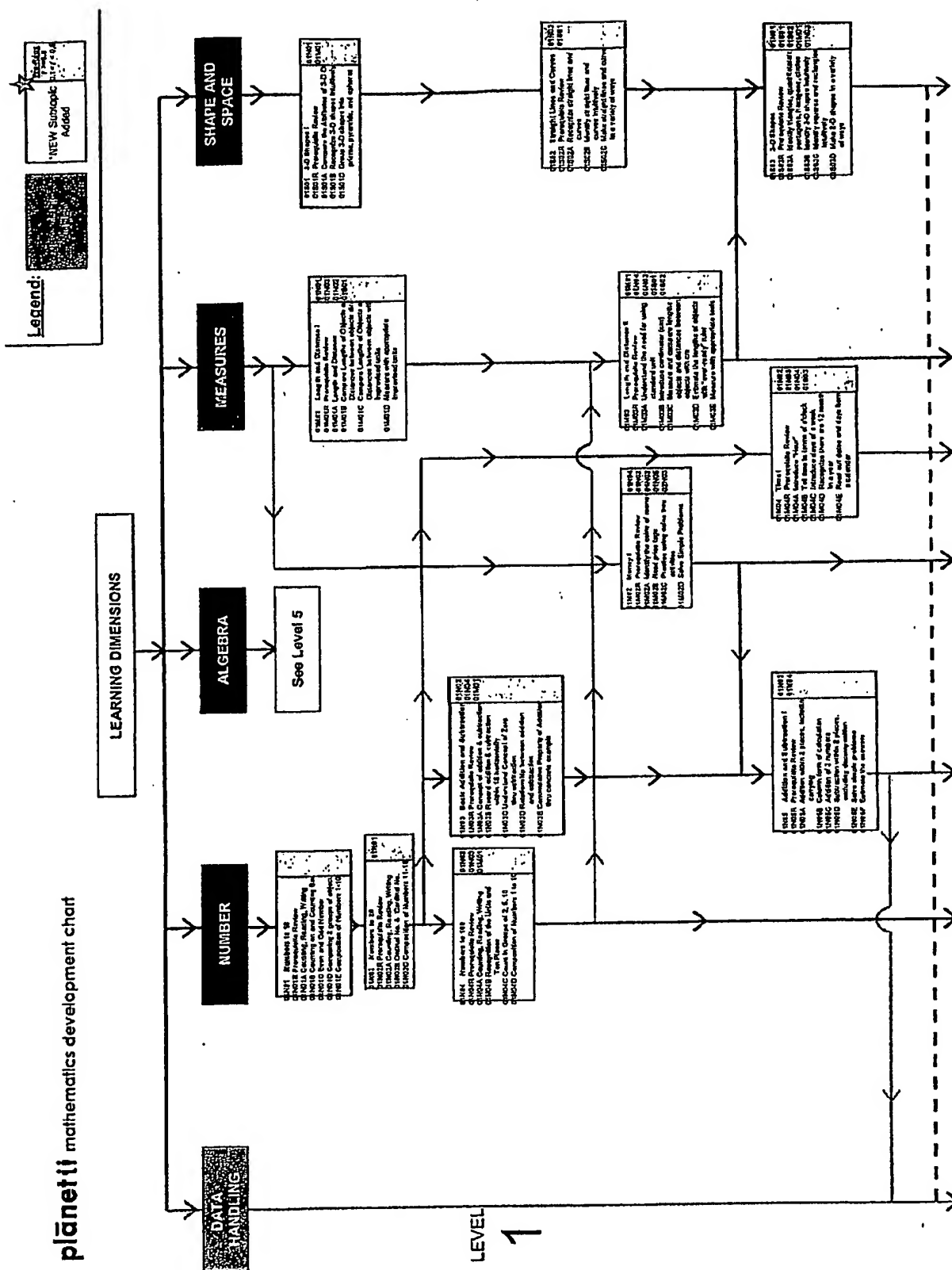
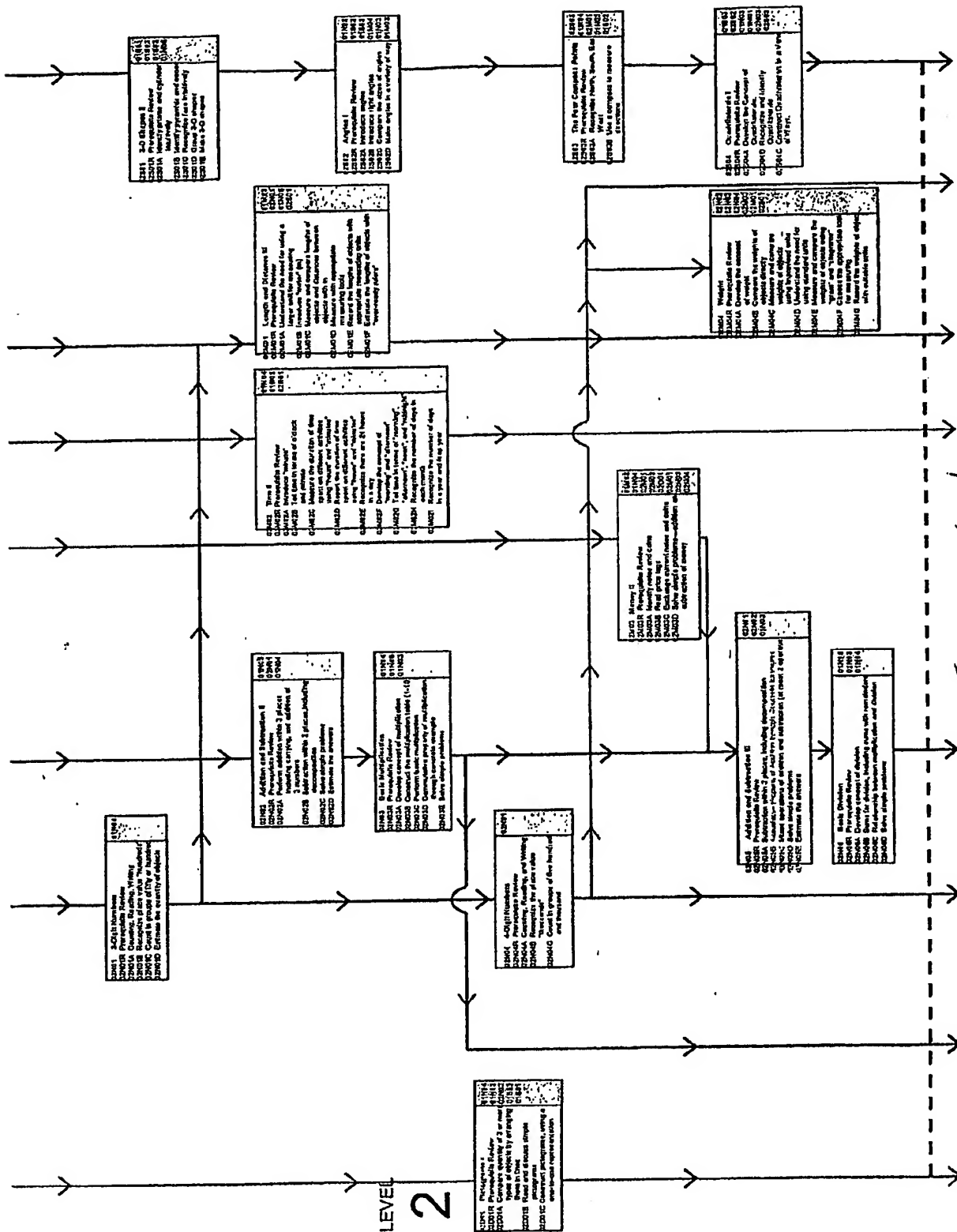


FIGURE 3



FILED

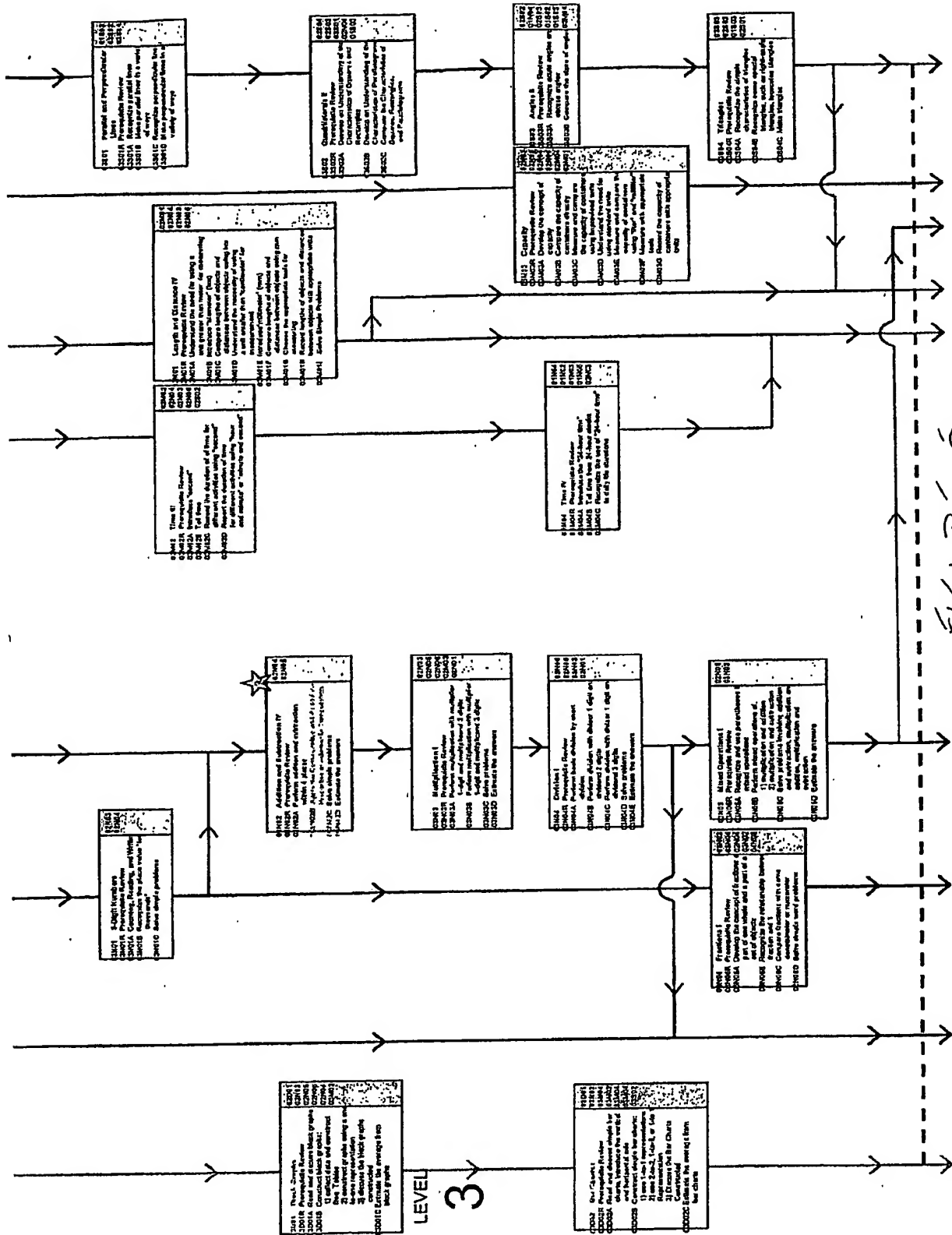


FIGURE 3

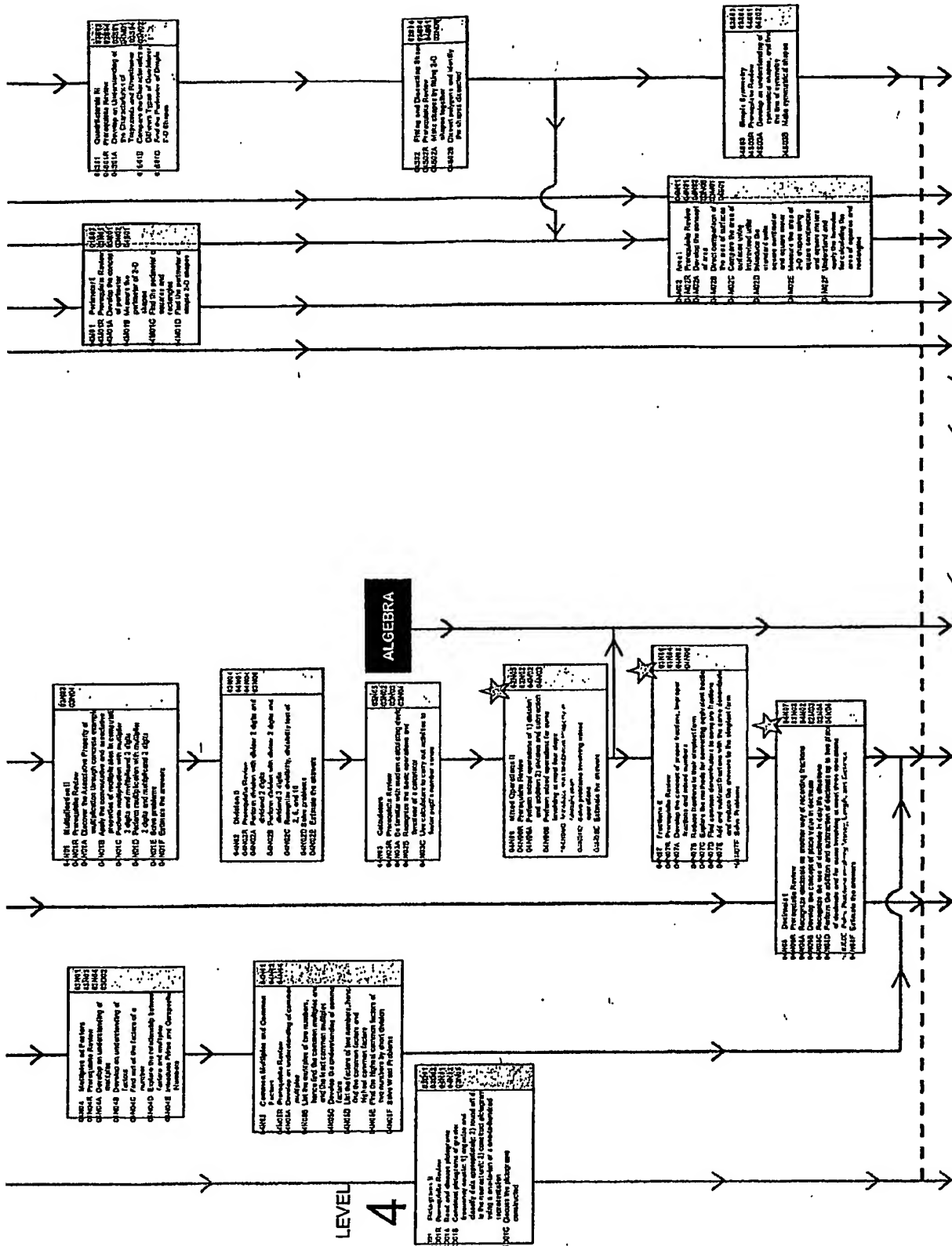
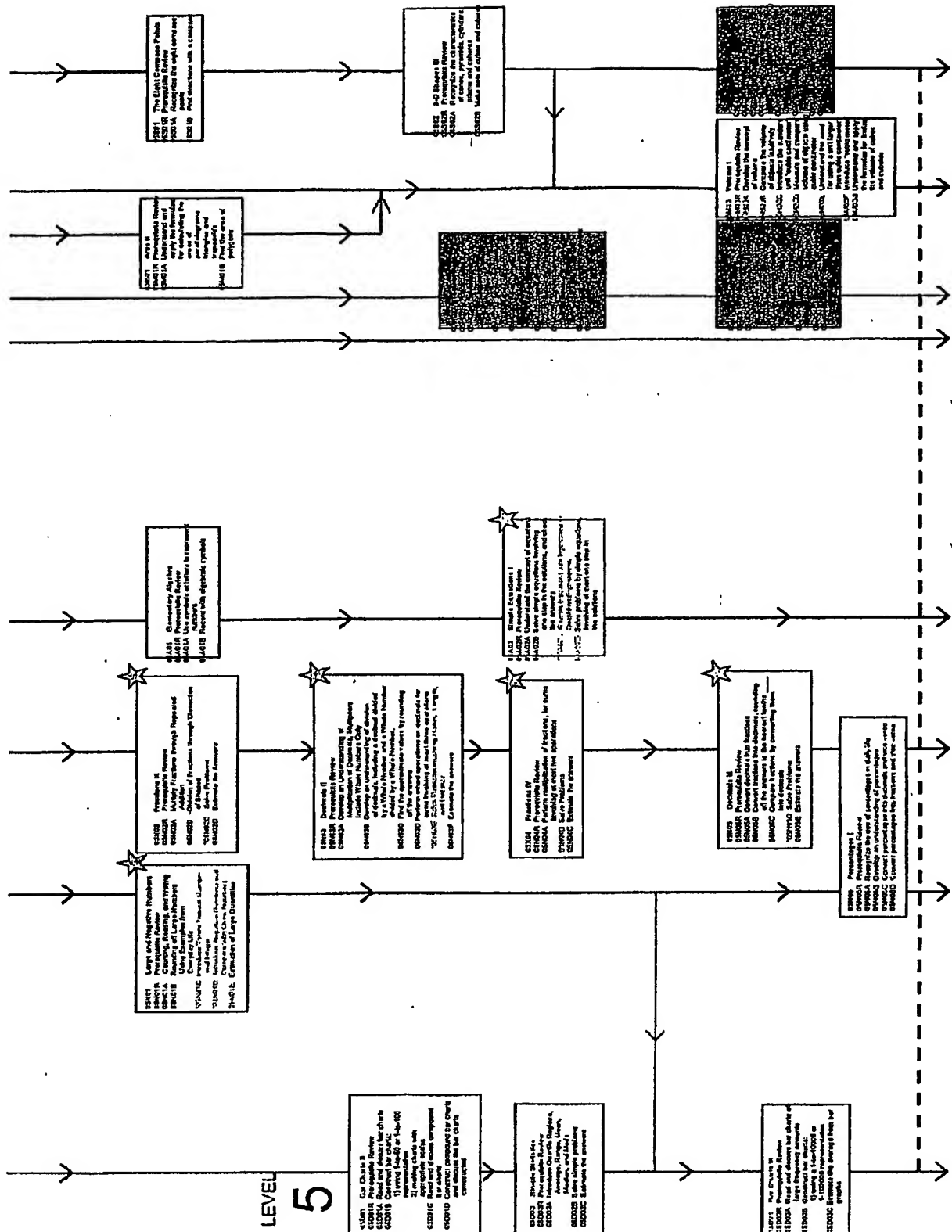
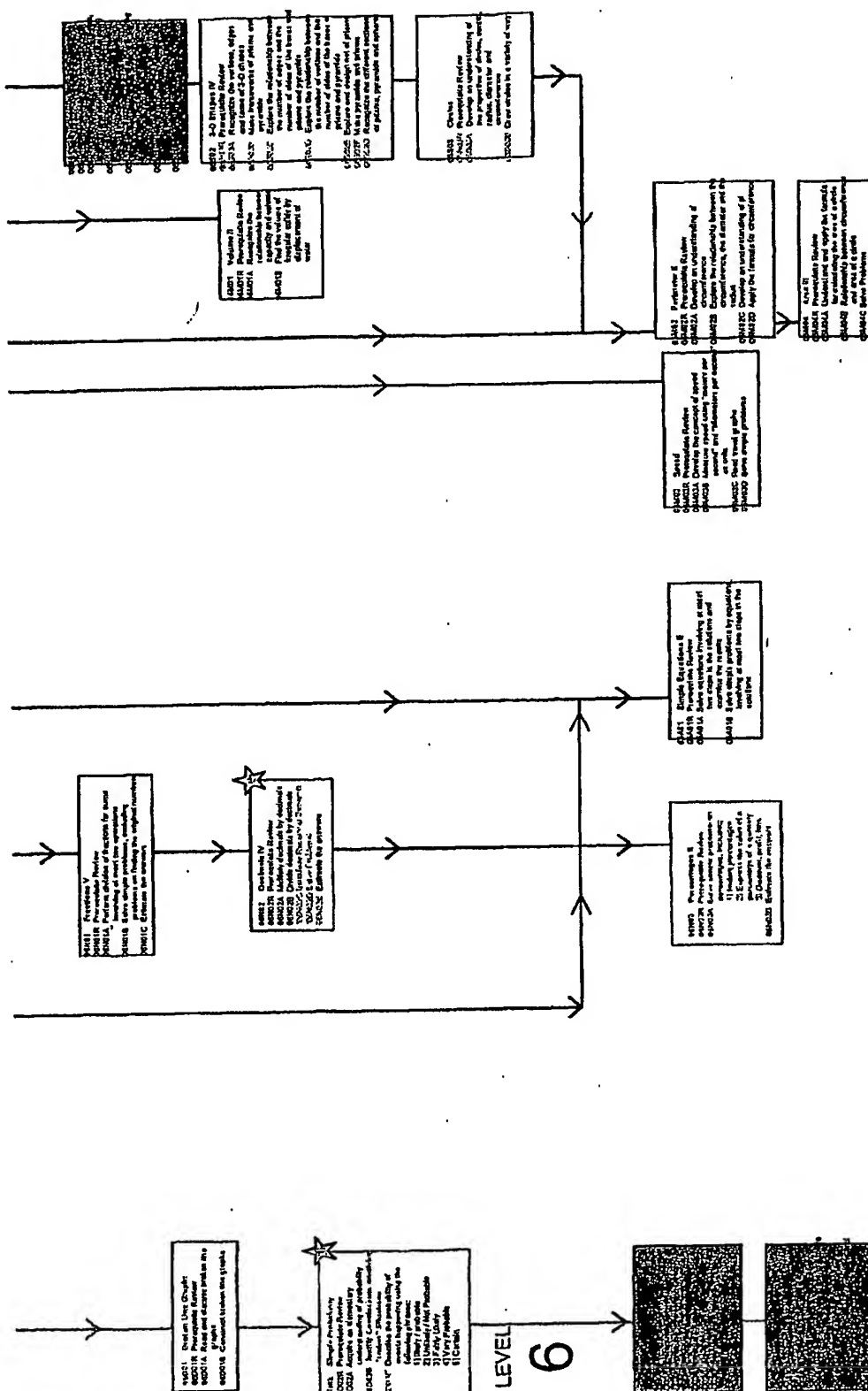


Fig. 2 R<sub>1</sub> L<sub>1</sub> 6



FILED 7



8/24/19

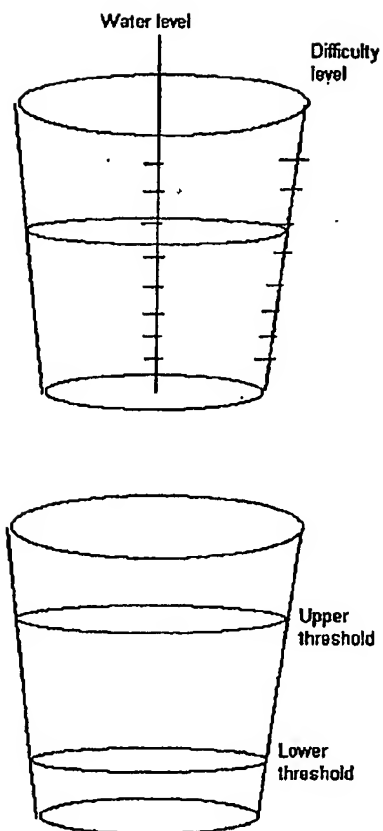
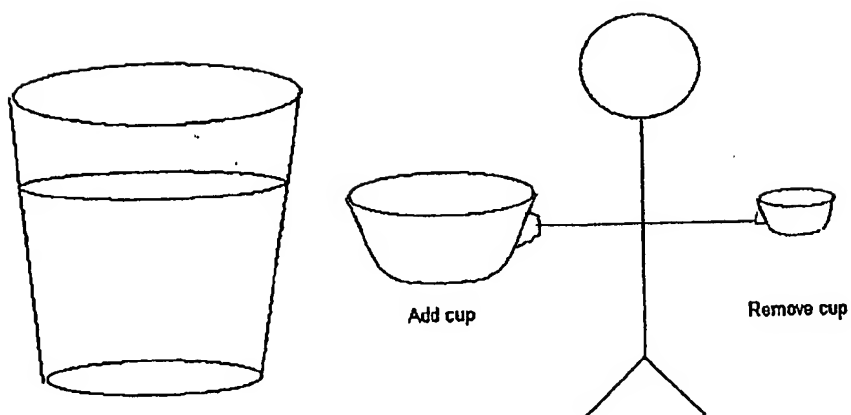


FIGURE 9.



Add cup and remove cup are different in sizes depending on the current state of the bucket



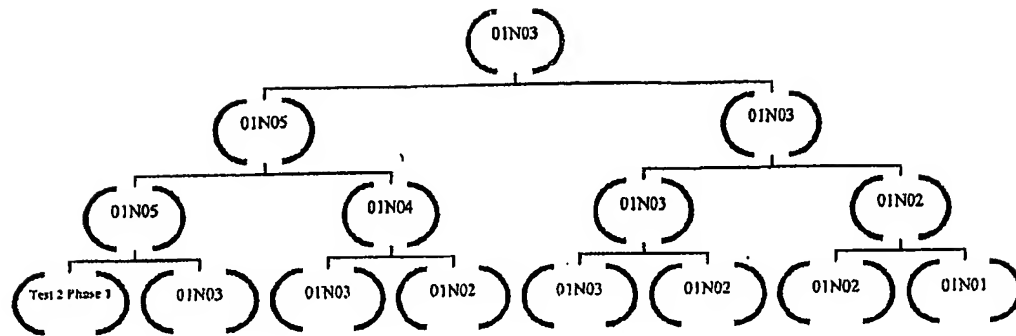


FIGURE 10

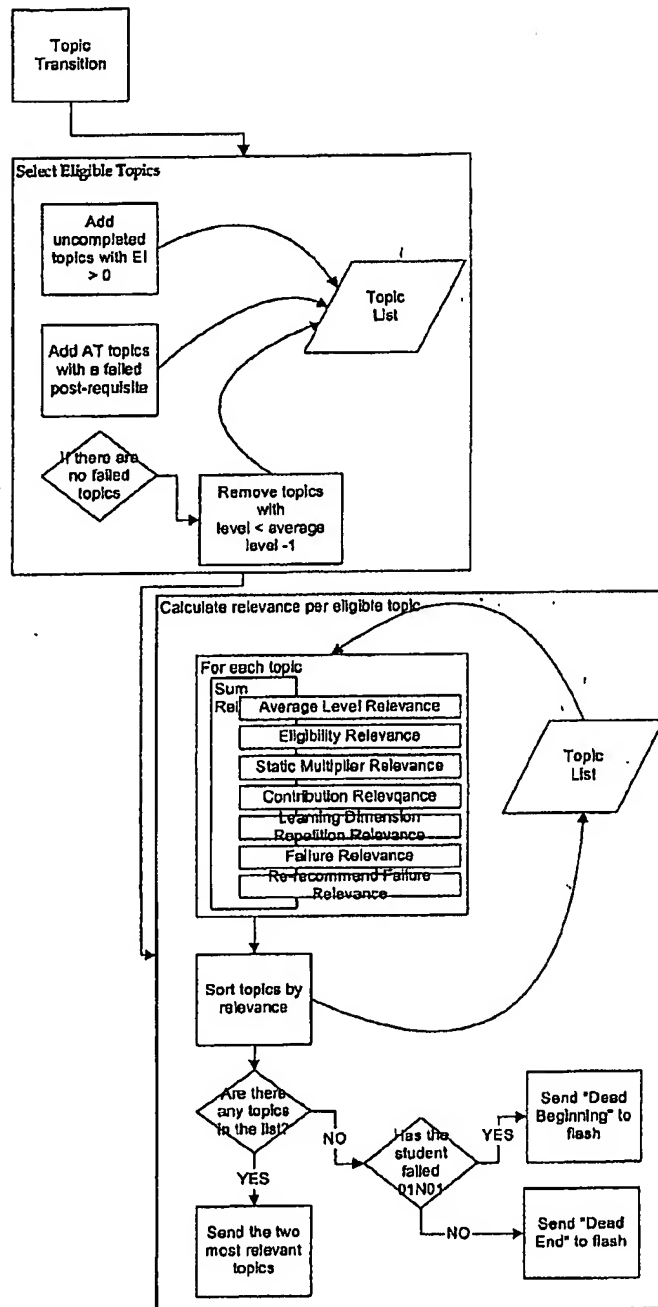
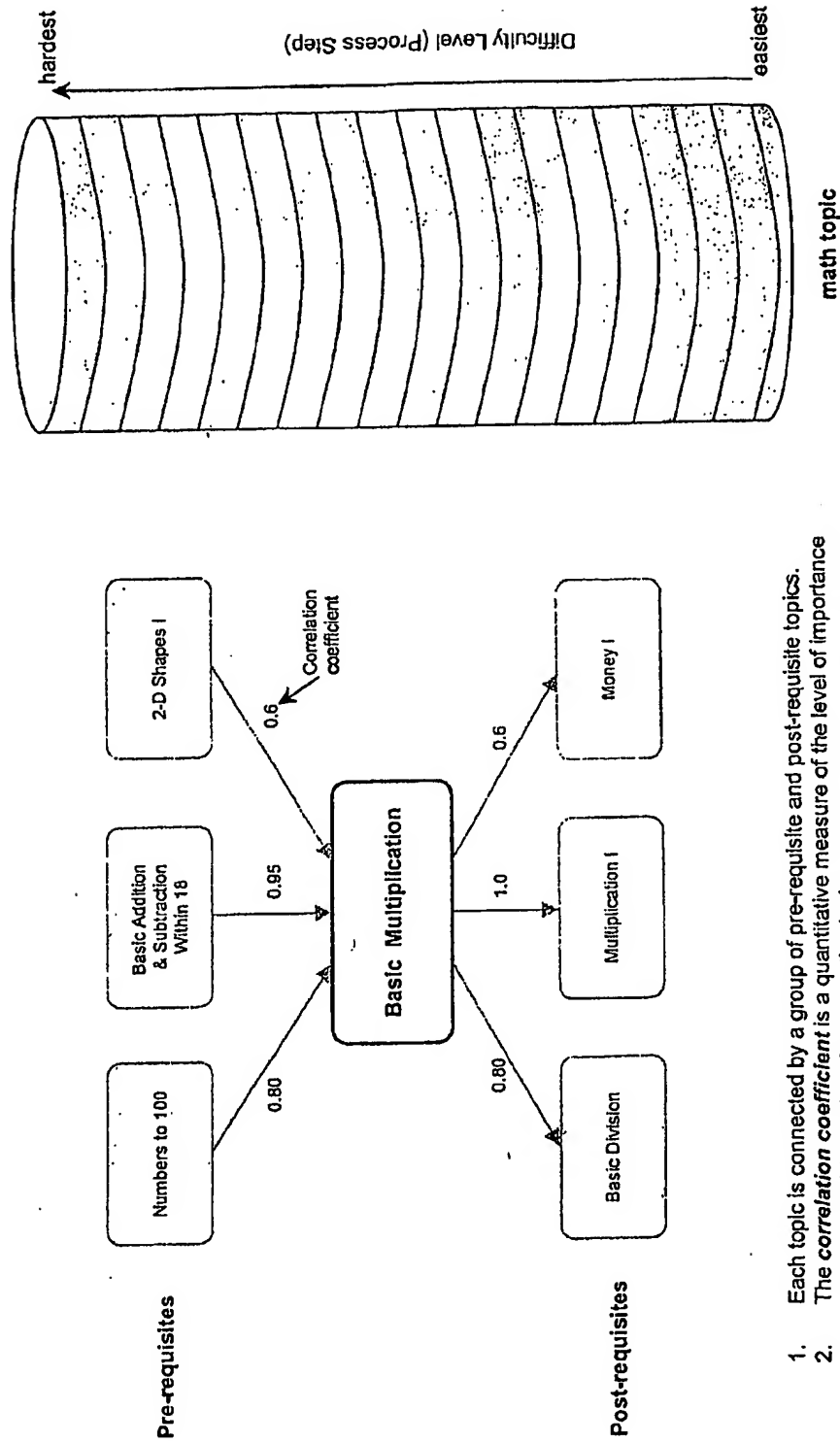


FIGURE 11

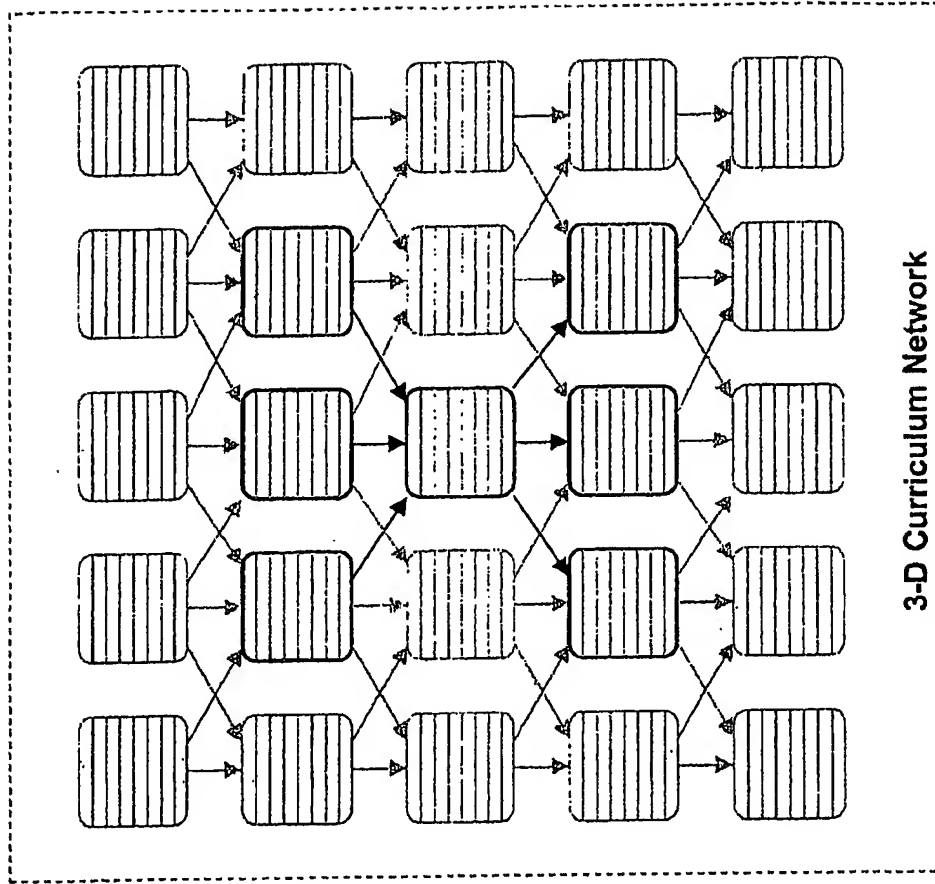
# planet*ii* Networked Math Curriculum



1. Each topic is connected by a group of pre-requisite and post-requisite topics.
2. The *correlation coefficient* is a quantitative measure of the level of importance of a pre-requisite topic to its respective topic.
3. Each topic is filled with questions sequenced by a wide range of difficulty levels.

FIGURE 12

planetii



3-D Curriculum Network

FIGURE 13

		2		4		6		8		10	
Item		Multiple Choice		Sample Question Text		Answer		Answer		Answer	
70	02000C	90	354 = ____ tens and 4 ones	5	35	354	50	b			
71	02000C	85	There were 65 people in the park. 37 of them were male. How many of them were female?	62 females	42 females	48 females	58 females	122 females	c		
72	02000C	95	Mrs. Kim sold 25 eggs this morning. She sold another 50 eggs in the afternoon. She still has 18 eggs left. How many eggs did she have to begin with?	83 eggs	75 eggs	25 eggs	68 eggs	7 eggs	a		
73	02000C	85	$654 + 354 =$ ____	1,208	1,108	1,158	500	208	a		
74	02000C	100	5 twos = ____	5 + 5	2 + 2	2 + 2 + 2	55	22	c		
75	02000C	100	4 threes = ____	4	8	12	6	8	c		
76	02000C	100	Grace is 30 years younger than her father. Her brother is 1 year older than Grace. Grace's father is 57 years old. How old is Grace's brother?	88 years old	27 years old	26 years old	26 years old	26 years old	a		

FIGURE 14

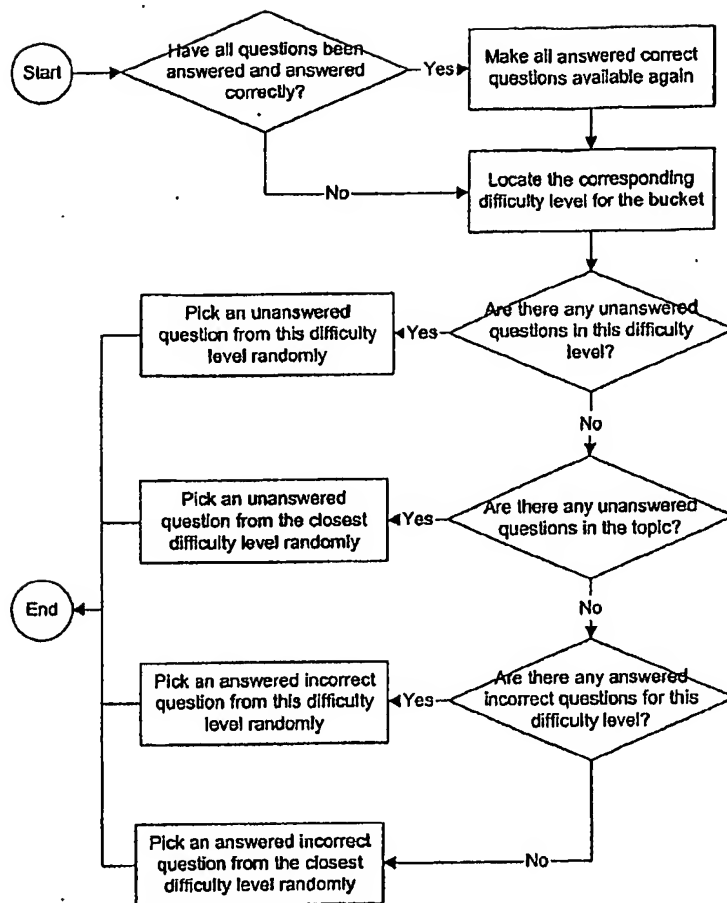


FIGURE 15

## **Exhibit C-2**

**FEDEX** USA AIRMAIL Express Tracking Number 8464 2674 6510

From: Patrice King  
Date: 4/13/05  
Sender's Address: 2224-2932-3

Sender's Name: Patrice King  
Phone: (973) 992-1990

Company: GOODWIN PROCTER LLP

Address: 103 EISENHOWER PKWY

City: ROSELAND State: NJ ZIP: 07068-1031

Your Internal Billing Reference: 102967-0113712

To: Joshua Levin  
Recipient's Name: Joshua Levin Phone: ( )

Company:

Address: 20 Dualey St. #1  
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City: Cambridge State: MA ZIP: 02140

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☐ FedEx 4Day Freight ☐ FedEx 5Day Freight ☐ FedEx 7Day Freight

☐ FedEx 9Day Freight ☐ FedEx 12Day Freight ☐ FedEx 15Day Freight

☐ FedEx 18Day Freight ☐ FedEx 21Day Freight ☐ FedEx 24Day Freight

☐ FedEx 27Day Freight ☐ FedEx 30Day Freight ☐ FedEx 33Day Freight

☐ FedEx 36Day Freight ☐ FedEx 39Day Freight ☐ FedEx 42Day Freight

☐ FedEx 45Day Freight ☐ FedEx 48Day Freight ☐ FedEx 51Day Freight

☐ FedEx 54Day Freight ☐ FedEx 57Day Freight ☐ FedEx 60Day Freight

☐ FedEx 63Day Freight ☐ FedEx 66Day Freight ☐ FedEx 69Day Freight

☐ FedEx 72Day Freight ☐ FedEx 75Day Freight ☐ FedEx 78Day Freight

☐ FedEx 81Day Freight ☐ FedEx 84Day Freight ☐ FedEx 87Day Freight

☐ FedEx 90Day Freight ☐ FedEx 93Day Freight ☐ FedEx 96Day Freight

☐ FedEx 99Day Freight ☐ FedEx 102Day Freight ☐ FedEx 105Day Freight

☐ FedEx 108Day Freight ☐ FedEx 111Day Freight ☐ FedEx 114Day Freight

☐ FedEx 117Day Freight ☐ FedEx 120Day Freight ☐ FedEx 123Day Freight

☐ FedEx 126Day Freight ☐ FedEx 129Day Freight ☐ FedEx 132Day Freight

☐ FedEx 135Day Freight ☐ FedEx 138Day Freight ☐ FedEx 141Day Freight

☐ FedEx 144Day Freight ☐ FedEx 147Day Freight ☐ FedEx 150Day Freight

☐ FedEx 153Day Freight ☐ FedEx 156Day Freight ☐ FedEx 159Day Freight

☐ FedEx 162Day Freight ☐ FedEx 165Day Freight ☐ FedEx 168Day Freight

☐ FedEx 171Day Freight ☐ FedEx 174Day Freight ☐ FedEx 177Day Freight

☐ FedEx 180Day Freight ☐ FedEx 183Day Freight ☐ FedEx 186Day Freight

☐ FedEx 189Day Freight ☐ FedEx 192Day Freight ☐ FedEx 195Day Freight

☐ FedEx 198Day Freight ☐ FedEx 201Day Freight ☐ FedEx 204Day Freight

☐ FedEx 207Day Freight ☐ FedEx 210Day Freight ☐ FedEx 213Day Freight

☐ FedEx 216Day Freight ☐ FedEx 219Day Freight ☐ FedEx 222Day Freight

☐ FedEx 225Day Freight ☐ FedEx 228Day Freight ☐ FedEx 231Day Freight

☐ FedEx 234Day Freight ☐ FedEx 237Day Freight ☐ FedEx 240Day Freight

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☐ FedEx 297Day Freight ☐ FedEx 300Day Freight ☐ FedEx 303Day Freight

☐ FedEx 306Day Freight ☐ FedEx 309Day Freight ☐ FedEx 312Day Freight

☐ FedEx 315Day Freight ☐ FedEx 318Day Freight ☐ FedEx 321Day Freight

☐ FedEx 324Day Freight ☐ FedEx 327Day Freight ☐ FedEx 330Day Freight

☐ FedEx 333Day Freight ☐ FedEx 336Day Freight ☐ FedEx 339Day Freight

☐ FedEx 342Day Freight ☐ FedEx 345Day Freight ☐ FedEx 348Day Freight

☐ FedEx 351Day Freight ☐ FedEx 354Day Freight ☐ FedEx 357Day Freight

PULL AND RETAIN THIS COPY BEFORE AFFIXING TO THE PACKAGE.

447



# GOODWIN PROCTER

Patrice A. King  
973-994-7896  
pking@goodwinprocter.com

Goodwin Procter LLP  
Counsellors at Law  
103 Eisenhower Parkway  
Roseland, NJ 07068  
T: 973-992-1990  
F: 973-992-4643

April 13, 2005

**Via E-Mail and Federal Express**

Joshua Levine  
20 Dudley Street - #1  
Cambridge, MA 02140

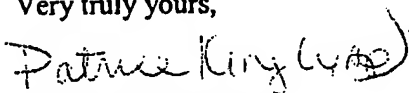
Re: U.S. Patent Application for ADAPTIVE ENGINE LOGIC USED IN TRAINING  
ACADEMIC PROFICIENCY  
Application No.: US 04/10222

Dear Joshua:

Enclosed please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. I have also enclosed a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Very truly yours,



Patrice A. King, Esq.

PZK:yap

Enclosure

## **Exhibit C-3**

FILE

King, Patrice A

**From:** King, Patrice A  
**Sent:** Tuesday, May 17, 2005 6:18 PM  
**To:** 'josh@hookerstreetband.com'  
**Cc:** Barberi, Katherine  
**Subject:** REMINDER - Planetii - US Patent Application  
**Importance:** High

REMINDER.

-----Original Message-----

**From:** King, Patrice A  
**Sent:** Tuesday, April 12, 2005 6:15 PM  
**To:** 'josh@hookerstreetband.com'  
**Cc:** 'Lewis Cheng'  
**Subject:** Planetii - US Patent Application  
**Importance:** High



WO2004090834A2.4405035\_1.doc (92  
pdf (2 MB)



KB)



Pii Assignment  
Rights-1.doc (2...

RETURN RECEIPT REQUESTED

*Via E-Mail and Federal Express*

US Patent Application for ADAPTIVE ENGINE LOGIC USED IN TRAINING ACADEMIC PROFICIENCY  
Appl. No.: US04/10222

Dear Joshua:

Attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney  
Goodwin Procter LLP  
103 Eisenhower Parkway

Roseland, New Jersey 07068  
Direct Dial: 973.994.7896  
General: 973.992.1990  
Fax: 973.992.4643  
E-mail: [pking@goodwinprocter.com](mailto:pking@goodwinprocter.com)  
URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)

## **Exhibit C-4**

*ship date*

Thu, Sep 15

*to*

Joshua Levine

20 Dudley St

# 1

Cambridge, MA 02140-1828

US

480-260-7930

*residential address*

Yes

*return label*

No

*from*

Patrice King (07023)

Goodwin Procter LLP

103 Eisenhower Parkway

Roseland, NJ 07068 US

9739947896

*billing*

Planetii USA Inc./General Patent

and Trademark

(102907/113712)

Documents

*operator*

Yvette Alvarez-Perez

973-422-7907

yperez@goodwinprocter.com

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## **Exhibit C-5**

**Barberi, Katherine**

---

**From:** King, Patrice A  
**Sent:** Monday, September 19, 2005 8:26 AM  
**To:** 'josh@hookerstreetband.com'  
**Cc:** Barberi, Katherine  
**Subject:** FW: Planetii - US Patent Application - URGENT REMINDER

**Importance:** High

URGENT REMINDER - DUE OCTOBER 1, 2005

Please see below.

-----Original Message-----

**From:** King, Patrice A  
**Sent:** Tuesday, April 12, 2005 6:15 PM  
**To:** 'josh@hookerstreetband.com'  
**Cc:** 'Lewis Cheng'  
**Subject:** Planetii - US Patent Application  
**Importance:** High



WO2004090834A2.4405035\_1.doc (95  
pdf (2 MB)



KB)



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RETURN RECEIPT REQUESTED

*Via E-Mail and Federal Express*

US Patent Application for ADAPTIVE ENGINE LOGIC USED IN TRAINING ACADEMIC PROFICIENCY  
Appl. No.: US04/10222

Dear Joshua:

Attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney



**Goodwin Procter LLP**  
103 Eisenhower Parkway  
Roseland, New Jersey 07068  
Direct Dial: 973.994.7896  
General: 973.992.1990  
Fax: 973.992.4643  
E-mail: [pking@goodwinprocter.com](mailto:pking@goodwinprocter.com)  
URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)

## **Exhibit D**

**Certificate of Express Mail**

I hereby certify that this and the enclosed paper(s) and/or fee(s) is/are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450.

<u>Robert P. Udal</u>	<u>EL 753212709 US</u>	<u>4/18/2007</u>
Robert P. Udal	"EXPRESS MAIL" Label No.	Date

Patent Application No.	: 10/551,663
Int. Appl. Filing Date	: April 02, 2004
Inventor	: Lewis Cheng et al
Title	: ADAPTIVE ENGINE LOGIC USED IN TRAINING ACADEMIC PROFICIENCY
Our Docket No.	: 102907-438-NP
Int'l Appl. No.	: PCT/US2004/10222
Int'l Appl. Filing Date	: 04/02/2004
Priority Date	: 04/02/2003

Mail Stop PCT  
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P.O. Box 1450  
Alexandria, VA 22313-1450

**SUPPLEMENTAL DECLARATION OF ROBERT P. UDAL IN SUPPORT OF  
RENEWED PETITION FOR FILING ON BEHALF OF NON-SIGNING INVENTOR(S)**

I, Robert P. Udal, Ph.D. declare the following:

1. I am a patent agent with Goodwin Procter LLP, attorney's of which are Applicant's, Planetii's, legal representative of record in the above-captioned patent application.
2. I am submitting this Declaration in support of Applicant's Petition Under 37 CFR 1.47(a) for Filing on Behalf of non-signing inventor, Joshua Levine.

3. According to Patrice King Declaration, see **Exhibit C**, paragraphs 3 and 6, Mr. Joshua Levine's e-mail address is: josh@hookerstreetband.com.
4. The URL: http://www.hookerstreetband.com/ is an Official Website of a rock band that goes by the name of "Hooker Street Band." A copy of the band web Homepage is hereto attached as **Exhibit D-1**.
5. On the Hooker Street Band Web Homepage are active links entitled:
  - a. Download Hooker Street Band "Release" from iTunes;
  - b. Hooker Street Band MySpace; and
  - c. Job Links.
6. The "Hooker Street Band MySpace" link, (b), leads to Hooker Street Band MySpace Web Homepage with the URL: http://www.myspace.com/hookerstreetband. A copy of the Hooker Street Band MySpace web Homepage is hereto attached as **Exhibit D-2**.
7. On the Hooker Street Band MySpace Web Homepage under the section entitled "Hooker Street Band: General Info" the following names are listed under the category of "Band Members":
  - a. Abbey Leroux;
  - b. **Josh Levine**; and
  - c. George Leonard III.

8. Each name of the three named Hooker Street Band members, including **Josh Levine's**, is an active link to a personal MySpace webpage for that particular member.
9. **Josh Levine's** name links to his personal MySpace webpage via the URL:  
[http://www.myspace.com/joshua\\_asher](http://www.myspace.com/joshua_asher). A copy of Mr. Levine's MySpace webpage is hereto attached as **Exhibit D-3**.
10. Mr. Levine's MySpace webpage displays, *inter alia*, his picture, which is entitled "Joshua Asher", and, among other things, the following details:
- i. Male
  - ii. 28 years old
  - iii. Brooklyn, NEW YORK
  - iv. United States
  - v. Last Login: 1/4/2007
11. I used **AutoTrackXP**, a powerful search tool for law enforcement agents and private investigators, which has the URL: <http://atxp.choicepoint.com>, to look for resident addresses in Massachusetts and New York states that match any of the synonyms for Mr. Joshua Levine (i.e. **LEVINE, JOSHUA ASHER; LEVINE, JOSHUA; and LEVINE, JOSH**) in combination with the factual statements of his age, current city and state of residence from his MySpace Homepage (i.e. Male; 28 years old; **Brooklyn; NEW YORK; United States; and Last Login: 1/4/2007**). Hereto attached as **Exhibit D-4** are a copy of AutoTrackXP homepage and a copy of the two addresses (also shown below) I identified for Mr. Joshua Levine.
- a. 20 DUDLEY ST 1  
CAMBRIDGE MA 02140

b. **163 PROSPECT ST  
BROOKLYN NY 11215**

12. The Cambridge, MA, address was apparently reported in MIDDLESEX County on 01/03/2005, whereas the Brooklyn, NY, address was apparently reported in Kings County on 03/01/2006 (see **Exhibit D-4**).
13. On 16 January 2007, I sent to Mr. Joshua Levine at his current residence address (i.e. **163 PROSPECT ST, BROOKLYN, NY 11215**) a FedEx Package containing a copy of combined Declaration of Inventorship and Power of Attorney, a copy of Patent Assignment, a copy of international application PCT/US04/10222 in the form of the published PCT, WO 2004/090834A2, and a letter him instructing him to review the application papers and to execute the Declaration of Inventorship and Patent Assignment. Hereto attached as **Exhibit D-5** are a copy of the letter I sent to Mr. Levine, a copy of the FedEx Label that I created for the FedEx Package, and a copy of Detailed Shipment Tracking Results indicating the package was successfully Delivered on 17 January 2007 at 10:09 a.m Eastern Time. The application papers I sent to Mr. Levine are the same as those included with, **Exhibit C**, Patrice A. King's Declaration (see **Exhibit C-1**).
14. Sometime during the day on 16 April 2007 a voice message was left on my voice mail at 212-813-8840 by a caller who identified himself as Joshua Levine.
15. The caller, Joshua Levine, also stated that he was a lawyer at the United States Attorney Office and the he could be reached at 212-637-2647.

16. In his voice message to me, the caller, Joshua Levine, informed me that he had received my letter and application papers, which I sent to his residence at 163 PROSPECT ST, BROOKLYN, NY 11215, that these application papers were misdirected because he was not the joint inventor of the invention instantly disclosed in the above-referenced application, who also is named Joshua Levine and whom we were trying to locate.
17. Consequently, the last known address for Joshua Levine who is the joint inventor in the above-captioned application remains: 20 DUDLEY ST 1, CAMBRIDGE, MA 02140.
18. As of the date of this Declaration I have not received executed application papers from Mr. Joshua Levine.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such false statements may jeopardize the validity of this document and application to which it relates.

Date: 4/18/2007

Robert Udal  
Robert P. Udal, Ph.D.

## **Exhibit D-1**



Are you alone here now?

Are you alone here now?

Download Hooker Street Band "Release"  
from iTunes

Are you alone here now?

Are you alone here now?

Hooker Street Band MySpace

## **Job Links**

Jobs

Sales Jobs

Marketing Jobs

## **Exhibit D-2**



DON'T LET YOUR  
INTERNET CONNECTION  
BOX YOU IN.

Web

Search



[Home](#) | [Browse](#) | [Search](#) | [Invite](#) | [Film](#) | [Mail](#) | [Blog](#) | [Favorites](#) | [Forum](#) | [Groups](#) | [Events](#) | [Videos](#) | [Music](#) | [Comedy](#) | [Cl](#)

## MYSPEACE MUSIC

[Music Videos](#) | [Directory](#) | [Search](#) | [Top Artists](#) | [Shows](#) | [Music Forums](#) | [Music Classifieds](#)

### Hooker Street Band

Rock / Pop / Acoustic



"We are inside that  
green thing"

Brooklyn, New York  
United States

Profile Views: 3253

Last Login:  
1/3/2007

View My: [Pics](#) | [Videos](#)

#### Contacting Hooker Street Band

	Send Message		Forward to Friend
	Add to Friends		Add to Favorites
	Instant Message		Block User
	Add to Group		Rank User

#### MySpace URL:

<http://www.myspace.com/hookerstreetband>

#### Hooker Street Band: General Info

Member Since	10/27/2004
Band Website	<a href="http://hookerstreetband.com">hookerstreetband.com</a>
Band Members	Abbey Leroux, Josh Levine, George Leonard III
Influences	The Beatles, Neil Young, Weezer, The Rolling Stones, Steve Earle...
Sounds Like	Beatles, Aerosmith, Steve Earle, Neil Young, Weezer
Type of Label	None



playing

00:00



Release  
2004

[Long Grass Side](#) Plays: 711

[Download](#) | [Rate](#) | [Comments](#) | [Lyrics](#) | [Add](#)

[All My Life](#) Plays: 1339

[Download](#) | [Rate](#) | [Comments](#) | [Lyrics](#) | [Add](#)

[Always](#) Plays: 762

[Download](#) | [Rate](#) | [Comments](#) | [Lyrics](#) | [Add](#)

**STANDAL**

#### Hooker Street Band's Latest Blog Entry [[Subscribe to this Blog](#)]

"... as in a record of an event. the event of people playing music in a  
([view more](#))

New York, NY ([view more](#))

George Leonard III ([view more](#))

Taking A Break ([view more](#))

I challenge Tila Tequila ([view more](#))

[[View All Blog Entries](#)]

#### About Hooker Street Band

We are a rock band that dares to challenge Macho Man Randy Savag holds barred, steel cage match. Our undying love for Owen Wilson a mothers is what fuels our musical joire de vivre. Someday the whole will wear Hooker Street Band T-Shirts and trucker hats HA HA HA H/ HA AHHA HA HA HA!!!! Our singer is good at Warcraft 3 and someti wear fake pirate tatoos.

#### Hooker Street Band's Friend Space

Hooker Street Band has 311 friends.

## **Exhibit D-3**

## FiOS

Fiber optic high-speed Internet

Get blazing speeds – Downloads up to 20 Mbps

Uploads up to 5 Mbps

**\$49.99/mo**

Check availability

Web

Search

powered by Google

[Home](#) | [Browse](#) | [Search](#) | [Invite](#) | [Film](#) | [Mail](#) | [Blog](#) | [Favorites](#) | [Forum](#) | [Groups](#) | [Events](#) | [Videos](#) | [Music](#) | [Comedy](#) | [Cl](#)

## Joshua Asher


[View My: Pics | Videos](#)

"Go happen!"

Male  
28 years old  
Brooklyn, NEW YORK

United States

Last Login: 1/4/2007

## Joshua Asher is in your extended network

### Joshua Asher's Latest Blog Entry [[Subscribe to this Blog](#)]

something from before ([view more](#))

George Motherfukkin Washington ([view more](#))

New York Apartment Hunting Guide and Dictionary ([view more](#))

The Golden Ass ([view more](#))

Randmnness ([view more](#))

[[View All Blog Entries](#)]

### Joshua Asher's Blurbs

#### About me:

The first thing to know about me is that i'm in my own extended network of friends. That means i'm friends with people who are friends with me, most certainly NOT friends with myself.

I like the things that make me breezy in the springtime with my mind drifting off into the heat. i'm not going to wake up a bug, but they won't wake up.

Now its fall. Lets make up a whistful fall thing i like. Ok, here: I like it when a leaf is plucked from its post and oscillates between a serene cascade and a tumbling rush finally gliding through the window of the cab i'm riding in smack into my forehead on the way to the airport.

I played in this **band**. Now I have no REAL band. I am in a FAKE band with some other dudes.

I am playing a show by myself at **169 bar** on september 22nd. You should come!!

Anyway, on to the old jargon **Go!**

**tai chi**, and flowers, and fishes.

If you don't love **fishes**, or know about them, i'll probably say "you should love them". I've told others, and they agreed later.

I'm an ENFP if you really care.

I am not a vegan, although i once was and when i ate the turkey for thanksgiving time it tasted simultaneously like bliss and rot.

Recently, i cut away the last thread of secrecy and now everyone knows everything. Plus, i'm falling.

### Contacting Joshua Asher

- |                 |                   |
|-----------------|-------------------|
| Send Message    | Forward to Friend |
| Add to Friends  | Add to Favorites  |
| Instant Message | Block User        |
| Add to Group    | Rank User         |

#### MySpace URL:

[http://www.myspace.com/joshua\\_asher](http://www.myspace.com/joshua_asher)

### Joshua Asher's Interests

<b>General</b>	guitar, singing, bass, drums, bass and drums, living, tai chi, warcraft, java, chess, go, taoism, physics, love, life, the universe, you, me, the tree, the rock, even between the earth and the ship...
<b>Music</b>	janes addiction, neil young, red hot chili peppers, beatles, jeff buckley, carter beauford band, counting crows, tom petty, al green, merle haggard, steve earle, janis joplin, live, ac/dc, aerosmith, tenacious D BABY! @..oasis?
<b>Movies</b>	the hunt for red october, strange days, chances are, face off, godfather I + II, the big lebowski, the south park movie, inner space, predator,

	terminator 2, bad taste, evil dead 2, the fugitive, star wars, indiana jones, vampire hunter D, akira, school of rock, ummm.....?
<b>Television</b>	I have stopped watching television and now there is truly no hope of me being able to talk with normal people.
<b>Books</b>	nah...
<b>Heroes</b>	My bro, or a tuna with lettuce? Maybe a turkey with cheese...
<b>Groups:</b>	<b>Boston Taoists</b>
	<b>View All Joshua Asher's Groups</b>

Joshua Asher's Details	
<b>Status:</b>	Single
<b>Here for:</b>	Networking, Friends
<b>Orientation:</b>	Straight
<b>Hometown:</b>	Sharon, MA
<b>Body type:</b>	5' 11" / Athletic
<b>Ethnicity:</b>	White / Caucasian
<b>Religion:</b>	Taoist
<b>Zodiac Sign:</b>	Virgo
<b>Children:</b>	Someday
<b>Education:</b>	High school

Joshua Asher's Schools	
<b>Wheeler School</b>	1983 to 1996
Providence, Rhode Island	
Graduated: <b>1996</b>	
Student status: Alumni	
Degree: High School Diploma	
Major: Yikes!	
Clubs: chess club, jazz group, singing group, outcast	

Joshua Asher's Networking	
<b>Music - Performance - Vocals</b>	
I try to sing	
<b>Music - Performance - Guitar</b>	
I learned to strum from watching neil young's arms	

History teachers can teach you a lot about history. They can also teach you a lot about the K1 point and how much of a potty mouth you are. Well, much of a potty mouth I am.

#### Who I'd like to meet:

People in the street! And I do. I ask them why they are afraid, or if there where a pool table is in the neighborhood. I ask them if they are friends in this town they say "no"

I don't let it be disheartening, although there is a bit of me that whispers, "why not?"

I like to go to the tea lounge and play chess with randoms and chat with uber-hip-crunchy tea lounge workers.

You better give that dude his bass back, and I'm glad because that kid liked you

The difference between my vocation and Jesus's vocation is that Jesus's vocation was ordained and mine is just because I'm lucky to get paid to abstract crap into a \$500 computer program for money.

Can you SEE it?

#### Joshua Asher's Friend Space

Joshua Asher has 444 friends.

m.



LongIDude



Abe Froman



Exun



Colleen



Winnie



YELLOPOP.COM



[View All of Joshua Asher](#)

#### Joshua Asher's Friends Comments

Displaying 46 of 213 comments ( [View All](#) | [Add Comment](#) )

La La	Dec 24 2006 4:51P

## **Exhibit D-4**



AutoTrackXP®

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[About AutoTrackXP](#)  
[Testimonials](#)  
[Subscriber Application](#)  
[Trade Show Schedule](#)  
[Product Training](#)  
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Help Prevent

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AT CHOICEPOINT

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NYSE





**JOSHUA A LEVINE** 

**Subject Information**

Name: JOSHUA A LEVINE  Age: 28  
SSN: 034-58-XXXX  Date of Birth: 09/XX/1978   
SSN WAS ISSUED IN  
MASSACHUSETTS BETWEEN  
1979 AND 1981  
AKA 1: LEVINE, JOSHUA, ASHER  
AKA 2: LEVINE, JOSHUA  
AKA 3: LEVINE, JOSH

**Address Information**

Address: 20 DUDLEY ST 1  County: MIDDLESEX  
CAMBRIDGE MA 02140 Date Reported: 01/03/2005  
  
Address: 163 PROSPECT ST  County: KINGS  
BROOKLYN NY 11215 Date Reported: 03/01/2006

**Source Information**

Source: Consumer Bureau 1  
File Creation 11/01/2000  
Date:  
Notes: Blanked data ("XX") cannot be displayed due to restrictions, but this data  
was used to generate results.

## **Exhibit D-5**

Robert P. Udall  
212.813.8840  
rudall@goodwinprocter.com

Goodwin Procter LLP  
Counsellors at Law  
599 Lexington Avenue  
New York, NY 10022  
T: 212.813.8800  
F: 212.355.3333

January 16, 2007

**By Federal Express**

**Mr. Joshua Levine**  
163 PROSPECT PARK W  
BROOKLYN, NY 11215  
(718) 832-4842

Re: Declaration of Inventorship and Patent Assignment  
U.S. Patent Application No. : 10/551,663  
Int. Appl. Filing Date : April 02, 2004  
Inventor : Lewis Cheng et al  
Title : ADAPTIVE ENGINE LOGIC USED IN TRAINING  
ACADEMIC PROFICIENCY  
Our Docket No. : 102907-438-NP

---

Dear Mr. Levine:

Enclosed please find for your review and execution a Declaration of Inventorship, a Patent Assignment and a copy of the published international application for the above-referenced application for patent. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii.

As a reminder, we would like to advise you that you also have an ongoing duty to disclose any known material prior art references relating to the subject matter in the above-referenced application. If you are aware of any prior art references, please provide a listing of such art including patents and publications. If available, please also provide copies of the listed references so that we can file the same with the United States Patent and Trademark Office.

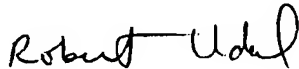
Mr. Levine, page 2.

Please review all documents and sign the declaration and the assignment papers and return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this letter and the enclosed documents.

Best Regards,

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert P. Udal". The signature is fluid and cursive, with a large initial "R" and a stylized "U".

Robert P. Udal, Ph.D.  
Science Advisor

Enclosures

cc: Richard I. Samuel, Esq.



*package id*  
0045362

*ship date*  
Tue, Jan 16

*to*  
Mr. Joshua Levine  
163 Prospect Park W  
Brooklyn, NY 11215-5271 US  
(718) 832-4842

*residential address*  
No

*return label*  
No

*from*  
Robert Udal (08961)  
Goodwin Procter LLP  
599 Lexington Ave FL 30  
New York, NY 10022-6030 US  
2128138840

*billing*  
Planetii USA Inc./General Patent  
and Trademark  
(102907/113712)

*operator*  
Lynn D'Ottavio  
212-459-7359  
ldottavio@goodwinprocter.com

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## Track Shipments Detailed Results

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**Tracking number** 791211158520  
**Signed for by** M.ALVAREZ  
**Ship date** Jan 16, 2007  
**Delivery date** Jan 17, 2007 10:09 AM

**Reference** 102907.113712.0  
8961

**Destination** Brooklyn, NY  
**Delivered to** Residence  
**Service type** Priority Pak  
**Weight** 2.0 lbs.

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Jan 17, 2007	10:09 AM	Delivered	
	8:35 AM	On FedEx vehicle for delivery	Brooklyn, NY
	7:34 AM	At local FedEx facility	BROOKLYN, NY
Jan 16, 2007	11:08 PM	Arrived at FedEx location	BROOKLYN, NY
	8:35 PM	Left origin	NEWARK, NJ
	7:30 PM	Picked up	NEW YORK, NY
	4:29 PM	Package data transmitted to FedEx	NEW YORK, NY

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<input type="text"/>	English	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>	English	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>	English	<input type="checkbox"/>	<input type="checkbox"/>

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Add personal message:

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non-English characters.

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## **Exhibit E**

May 20, 2002

Joshua Levine  
4549 49<sup>th</sup> Street  
Woodside, NY 11377

**plānetii**

Dear Joshua:

We are pleased to offer you a position at PLANETii USA Inc. ("PLANETii") as Senior Developer beginning on May 22, 2002, under the terms and conditions set forth below. You will report directly to Kyung Lee. As Senior Developer, you will be compensated at a rate of US\$7,084 monthly (US\$85,008 pro-rated annually) in accordance with PLANETii's standard payroll practices. All amounts payable to you shall be reduced by standard withholdings and other authorized deductions.

Your first performance review will be on December 15, 2002. Your rate of compensation may be increased, depending on your overall performance, and will be decided by the management of PLANETii.

You are also eligible for PLANETii's health and dental insurance coverage after the 3<sup>rd</sup> month of employment. If you choose to enroll, PLANETii pays 50% of the associated costs of your health and dental plan. Please do not hesitate to ask us for more details about our particular plan details.

As an employee of PLANETii, you understand that, in its business, PLANETii has developed and will use commercially valuable technical and non-technical information that is vital to the success of PLANETii's business. You understand that it is necessary for PLANETii to protect such information as confidential and proprietary ("Confidential and Proprietary Information"). Such Confidential and Proprietary Information shall include: (a) research and development work; source code; object code; run-time libraries; system documentation; software-related documentation; system configurations; hardware design; firmware design; layout; and operation of PLANETii's facilities and equipment; all of these items for both customers/clients and for PLANETii's internal operations; (b) contents of proposals/contracts with all former, existing, and prospective customers/clients; costing and estimation procedures and formulae regarding proposals and other uses; sales, profit and loss, profit margin, production costs, overhead, and other bookkeeping and accounting information; all information regarding business development and marketing; names of vendors and suppliers not well known to the trade; all contacts at all such vendors and suppliers whether or not such vendors and suppliers are well known to the trade; costs and contents of proposals and contracts with such vendors and suppliers; and (c) confidential information revealed to PLANETii by third parties and which PLANETii is obligated to keep confidential; all copies of this agreement, and any other information that may be considered by PLANETii as PLANETii's confidential information under applicable laws. Confidential and Proprietary Information shall not include information which is, or becomes, in the public domain, unless this occurs through a breach of any of the obligations hereunder; information in your possession from a third party source that is not in breach of any obligation owed to PLANETii; or information required to be disclosed by law.

You agree to hold in confidence all Confidential and Proprietary Information disclosed to you or developed by you in connection with your employment by PLANETii, either in writing, verbally, or as a result of your employment. You shall not, without permission of PLANETii, use or duplicate Confidential and Proprietary Information that you are obligated hereunder to maintain in confidence for any reason other than to enable you to properly and completely perform your job. You shall immediately notify PLANETii of any information that comes to your attention that does or might indicate that there has been any loss of confidentiality of such Confidential and Proprietary Information. Upon termination of employment for any reason whatsoever, or upon PLANETii's request, you shall promptly return all correspondence, drawings, blue prints, manuals, letters, notes, notebooks, reports, flowcharts, programs, proposals, documents concerning PLANETii's customers/clients and vendors/suppliers, documents concerning products or processes used by PLANETii, and all other documents, writing, and materials utilized by you, together with any copies or other reproductions made in any medium thereof made by you or in your possession or control. You understand that all such records, whether developed by you or others, are and shall remain the property of PLANETii.





Additionally, all files, input and output materials, the media upon which they are located (including cards, tapes, discs and other storage facilities), software programs or packages (together with any related documentation, and any related materials), database information and other materials which are designed, written or developed in the course of your employment, or any such materials designed, written or developed for or delivered to PLANETii, or designed, written or developed with the use of PLANETii property or personnel, and which may or may not be either confidential or proprietary (collectively, the "PLANETii Materials") shall, as between you and PLANETii, be the sole and exclusive property of PLANETii.

You agree that PLANETii Materials shall be a "work made for hire" (as defined in the Copyright Act of 1976), and that PLANETii shall be considered the author of PLANETii Materials for all purposes and the owner of all the rights comprised in the undivided copyright (and all renewals and extensions thereof) in and to PLANETii Materials and of any and all other rights in PLANETii Materials including patents, trade secret rights, trademarks and other proprietary rights.

In the event that PLANETii Materials are determined not to be a work made for hire and/or there are any rights which do not accrue to PLANETii under this Section, the Agreement shall operate as an irrevocable grant, transfer, sale and assignment to PLANETii of all right, title and interest, including all undivided copyrights (and renewals and extensions thereof) patents, trade secret rights, trademarks and other proprietary rights, in and to PLANETii Materials throughout the universe in all languages and in all media and forms of expressions and communication now known or later developed. The foregoing shall be effective as to each item created by you under this Agreement as of the moment such item is fixed in a tangible medium whether or not such item is complete. Accordingly, PLANETii shall own all works in progress. You shall have no rights of any kind in PLANETii Materials. No rights are reserved to you. You shall execute any and all documents required to effectuate this assignment as PLANETii may reasonably request from time to time.

Further, you shall not, during your employment and for a period of one year following the separation of your employment for any reason, directly or indirectly, influence, solicit or canvass, or attempt to influence, solicit or canvass (a) any customer/vendor of PLANETii to divert their business to any person or entity then in competition with PLANETii (ie., web mathematics tutorial products/services), or otherwise attempt induce any customers to terminate their relationship with PLANETii, or (b) any employee of PLANETii to work for any individual or entity then in competition with the business of PLANETii, or otherwise to terminate his or her relationship with PLANETii.

You recognize and agree that your employment relationship with PLANETii will be "at-will" for all purposes, which means that either you or PLANETii may terminate your employment at any time for any reason. You recognize and agree that this offer of employment is not intended to be and should not be construed to be a contract of employment for any specified duration. Further, PLANETii reserves the right at any time to transfer or second your employment to other companies within PLANETii's group of companies to perform any other reasonable duties (either in addition to or in substitution for your then existing duties). You agree to devote your working time to PLANETii and not engage in other employment unless granted by prior written permission by your manager.

You understand that you have no authority either express or implied, to act or represent that you are acting on behalf of PLANETii, except in those instances in which PLANETii has given you prior written consent that specifically covers your acts or representations. You may not receive any income or material gain from any individuals or entities outside PLANETii for materials produced or service rendered while employed by PLANETii without the prior consent of the President or the Chief Executive Officer of PLANETii.

By accepting this offer, you affirm that you have the full right and authority to accept this offer and to perform any services required of you in your position as Senior Developer, and that by accepting this offer and performing such services you are not breaching any contract or legal obligation you owe to any third party. You acknowledge and understand that your employment is contingent upon verification of your identity and your ability to work for PLANETii and receive compensation for such work.

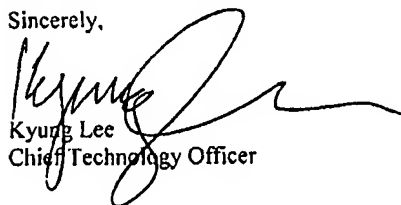
**plānetii**

You acknowledge that PLANETii will be irreparably harmed if your obligations hereunder are not specifically enforced and that PLANETii would not have an adequate remedy at law in the event of an actual or threatened violation by you of your obligations hereunder. Therefore, you agree and consent that PLANETii shall be entitled to an injunction or any appropriate decree of specific performance of any actual or threatened violation or breaches by you or your agent, without the posting of any bond, and such other relief as may be just and proper, including the right to recover all losses or damages suffered by PLANETii resulting from any such breach of threatened breach. You further agree that, in such event, you shall reimburse PLANETii for its attorneys' fees and costs. In the event PLANETii applies to seal any papers produced or files in any judicial proceedings to preserve confidentiality, then you specifically agree not to oppose such application. You consent to the exclusive jurisdiction of the federal and state sitting in the State of New York for all such purposes, and waive any claims you may have that jurisdiction is not proper or such venue is not convenient. The parties hereto further consent that any summons and complaint or notice may be served by certified mail, return receipt requested at the address set forth above.

This offer supersedes and replaces any and all prior offers, agreements, statements, and representations made, whether written or oral, including statements and representations made in any advertisement or in the course of any job interviews, discussions, or negotiations for this position. This offer cannot be amended or otherwise modified and no breach or term of this offer letter may be waived except by a writing signed by a duly authorized officer of PLANETii. This agreement shall be construed and enforced according to the laws of the State of New York applying to contracts that are wholly performed within New York, without regard to principles of conflicts of law.

Joshua, we look forward to having you become a member of the PLANETii team and hope you will find this position to be a rewarding career opportunity. With your background and experience, we think you will be an excellent fit for this position as well as a great asset to our company. If you require any additional information, please call me at (718) 625-8542.

Sincerely,

  
Kyung Lee  
Chief Technology Officer

Please sign and return one copy of this letter to indicate your acceptance of the terms of this offer letter and retain one copy for your records.

Offer Accepted:

  
Joshua Levine

Date

5/20/02

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, Bella Kong, and Simon Lee, each citizens of Canada, and Jason Ng and Joshua Levine, each citizens of the United States, as ASSIGNORS, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040, USA; 21732 Lindy Lane, Cupertino CA 95014, USA; Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong; 50 Bayard Street #7M, New York, NY 10013, USA; and 20 Dudley St #1, Cambridge, MA 02140, USA; are the inventors of the invention entitled, Adaptive Engine Logic Used in Training Academic Proficiency, for which an application for a United States Patent was filed on April 2, 2003, Serial no. 60/459,773, and for which a PCT application was filed on April 2, 2004, Serial no. PCT/US04/10222 and,

WHEREAS, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: 4/28/05

  
Lewis Cheng

Date: 04/28/05

  
Bella Kong

Date: 5/3/05

  
Jason Ng

Date: \_\_\_\_\_

\_\_\_\_\_  
Simon Lee

Date: \_\_\_\_\_

\_\_\_\_\_  
Joshua Levine

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, Bella Kong, and Simon Lee, each citizens of Canada, and Jason Ng and Joshua Levine, each citizens of the United States, as ASSIGNORS, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040, USA; 21732 Lindy Lane, Cupertino CA 95014, USA; Flat C, 35/F, Tower 1, Sorrento, 1 Austin Rd. West, Tsim Sha Tsui, Hong Kong; 50 Bayard Street #7M, New York, NY 10013, USA; and 20 Dudley St #1, Cambridge, MA 02140, USA; are the inventors of the invention entitled, Adaptive Engine Logic Used in Training Academic Proficiency, for which an application for a United States Patent was filed on April 2, 2003, Serial no. 60/459,773, and for which a PCT application was filed on April 2, 2004, Serial no. PCT/US04/10222 and,

WHEREAS, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date:

04/28/05

Lewis Cheng

Date:

04/28/05

Bella Kong

Date:

Date:

05/12/05

Jason Ng

Simon Lee

Date:

Joshua Levine